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ABSTRACT

This guide was prepared to assist vocational teachers in developing and implementing competency-based education in their classrooms and laboratories throughout secondary vocational and adult programs in Virginia. The guide may also (1) provide general and specific information on competency-based education (CBE); (2) serve as a resource for inservice workshops; (3) serve as a resource manual for preservice and inservice teacher education courses; (4) provide specific information on CBE materials, formats, and resources used in vocational and adult programs; and (5) serve as a guide for developing and revising vocational programs to meet Virginia CBE standards. The guide is divided into six major sections. The first section provides general information concerning CBE principles, characteristics, and requirements for vocational programs. The next four sections parallel Virginia CBE standards and provide specific information, sample materials, and 10 suggested steps for implementing CBE. Topics covered include identifying competencies and developing objectives, individualizing, using instructional methods, selecting instructional materials, measuring learning, developing tests, testing procedures, and managing competency records. The final section of the guide includes information on instructional resources and materials available for implementing CBE. Sample materials and a bibliography complete the document. (KC)

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**GUIDE
FOR
IMPLEMENTING
COMPETENCY-BASED EDUCATION
IN
VOCATIONAL PROGRAMS**

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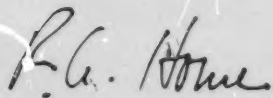
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Dear Educator:

The primary purpose of this publication is to provide a guide for implementing competency-based education at the local level. This guide and a series of instructional resource guides for competency-based education will assist Virginia's vocational educators in reaching the 1984 implementation goal.

Comments, suggestions, and questions concerning the guide should be sent to the project director or Supervisor, Vocational Curriculum Development, Department of Education.



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FOREWORD

In the next decade there will be opportunities for the worker with skills and knowledge in businesses and industries in the Commonwealth of Virginia. Vocational education at the secondary and post-secondary levels will be responsible for preparing these individuals for a variety of occupations and roles.

Through vocational education, students will be prepared to assume roles in the work force in the Commonwealth. In addition, preparing students through programs that are competency-based and articulated from middle school to post-secondary levels, will enhance their chances of success in an ever increasing complex society.

This guide has been prepared to assist teachers and administrators in providing instruction which is role-relevant and serves the needs of today's students. It also will assist the vocational educator in implementing Virginia Competency-Based Education (CBE) Standards.

Melvin R. Garner
Administrative Director
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Education

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The development and completion of this guide required a vast expenditure of time, effort, and teamwork by the project director and staff. The educators who served as an editorial and review committee for this guide are most deserving of recognition for their dedication, time, and expertise.

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INTRODUCTION

Vocational educators in Virginia are working toward a common goal: to provide role-relevant education in the public schools. Since 1971, this effort has been directed toward the implementation of competency-based education in the vocational programs at the secondary and post-secondary levels within the Commonwealth. Steady progress is being made to achieve this goal. Through the concerted efforts of vocational educators, the objective in 1977-82 State Plan for Vocational Education will be partially met this year:

June 30, 1982, each school division shall have implemented competency-based instruction in approved vocational education programs based on V-TECS and IDECC catalogues if available or other competency-based materials as reported in the annual Local Evaluation Programs, and each community college shall have implemented competency-based instruction in at least one program based on V-TECS materials as reported by the Virginia Community College System.

Full implementation of competency-based vocational education is expected in September, 1984. In order to meet this goal, vocational educators need specific information and assistance to implement competency-based education. This publication and a series of instructional resource guides for fifty-seven vocational programs will assist vocational educators in achieving the 1984 implementation goal.

Purposes

Thus, the primary goal of this publication is to assist vocational teachers in developing and implementing competency-based education in their classrooms and laboratories throughout secondary vocational and adult programs in the state. This guide also serves the following purposes:

1. To provide general and specific information on CBE.
2. To serve as a resource for inservice workshops.

3. To serve as a resource manual for preservice and inservice teacher education courses.
4. To provide specific information on CBE materials, formats, and resources used in vocational and adult programs.
5. To serve as a guide for developing and revising vocational programs to meet Virginia CBE Standards.

Organization of Guide

The guide is organized and designed to provide the necessary information and materials for implementing competency-based education in vocational programs. The content is divided into six major sections. The first section provides general information concerning CBE principles, characteristics, and requirements for vocational programs. The next four sections parallel the Virginia CBE Standards and provide specific information, sample materials and suggested steps for implementing CBE. The final section of the guide includes information on instructional resources and materials available for implementing CBE.

In the four sections which parallel the Virginia CBE Standards, a ten-step implementation procedure is presented. The implementation procedure will assist a teacher in the development of a competency-based vocational program which meets the Virginia CBE Standards.

SECTION I

"Educational programs in which required knowledge, skills, and attitudes are based on role-relevant competencies."

COMPETENCY-BASED EDUCATION

The primary goal of vocational education in Virginia is to ensure that youths and adults possess the appropriate skills, knowledge, and attitudes required for success in education and employment. The development and implementation of competency-based education (CBE) is one method of reaching the primary goal of vocational education. The principles of CBE are not unique to educational programs but have been applied for many years in business and industrial training, as well as in military technical training programs. The medical profession uses CBE principles for training doctors, nurses, and paraprofessionals. Furthermore, there are many examples of CBE in our everyday lives. For example, learning to drive an automobile and obtaining a driver's license actually are competency-based. The skills and knowledge required for driving are identified by appropriate state agencies, as well as standards for judging driver skills.

Competency-based education requires that the desired knowledge, skills, and attitudes be based on role-relevant competencies performed by workers for occupational programs. In other programs, such as consumer and homemaking, industrial arts orientation/exploration, competencies are based on nonoccupational roles. Therefore, competency-based education in Virginia is defined as:

Educational programs in which required knowledge, skills, and attitudes are based on role-relevant competencies.

Competency-based education is further defined in the Virginia Vocational and Adult Education CBE Standards: Requirements and Criteria (1980), which provides a framework for developing and implementing CBE in all secondary vocational and adult education programs. Eventually, the standards will be used to determine whether vocational programs are competency-based. The Virginia CBE Standards (1976) are as follows:

I. ROLE-RELEVANT COMPETENCIES THAT INCLUDE STANDARDS ARE IDENTIFIED AND STATED.

The competencies, with standards, will be identified through Vocational-Technical Education Consortium of States (V-TECS), Interstate Distributive Education Curriculum Consortium (IDECC), and other appropriate research. Advisory committees should be used to review competencies and standards. Competencies in the affective domain will be included. Role-relevant competencies for occupational preparation programs are those that specifically relate to the occupation for which the student is being prepared as well as to the personal needs of the student. Role-relevant competencies are related also to orientation, exploration and/or industrial arts experiences which have been identified for students.

II. COMPETENCIES ARE SPECIFIED TO STUDENTS PRIOR TO INSTRUCTION.

A system exists to inform students about what will be expected of them at program completion. For example, teachers may provide profiles, checksheets, training plans, contracts, or other structured methods to identify outcomes so that students are aware of expected outcomes.

III. CRITERION-REFERENCED MEASURES ARE USED TO MEASURE ACHIEVEMENT OF COMPETENCIES.

Criterion-referenced measures are based on standards that are measurable. Student performance is measured against predetermined standards rather than against other students' accomplishments.

IV. A SYSTEM EXISTS FOR DOCUMENTING THE COMPETENCIES ACHIEVED BY EACH STUDENT.

The documentation provides a record of competencies achieved. The documentation may be used for articulation of the program to provide a smooth transition of the student from one school to another or from one level of instruction to another level. The documentation is also a means of providing information to employers.

Characteristic of CBE

Competency-based educational programs may be described by certain characteristics common to most competency-based vocational programs. However, not all the characteristics are required. The following characteristics have been divided into two groups: required and helpful. The required charac-

teristics are based on the Virginia CBE Standards, while the helpful characteristics enhance the CBE program:

Required

1. Course content is based upon required tasks/competencies. Competencies to be learned by the students are determined in advance of instruction by task analysis methods. The purpose of the task analysis is to find out what is required for success in employment or education. The content for the program is based on the results of the task analysis.
2. Performance objectives are developed for the program. The content of the program is developed and stated in the form of performance objectives. There is one performance objective for each task/competency. In addition to the performance objectives, enabling objectives sometimes are developed for CBE programs.
3. The required competencies are specified to the student prior to instruction. The specific requirements and content of the program, course, or unit of instruction is provided to the student prior to learning. This helps the student understand what is required and, thus, facilitates learning.
4. Student achievement is based upon demonstrated competency. The performance of skills is of prime importance in CBE. Whether the competency deals with skills, knowledge or attitudes, the competency must be demonstrated at the minimal level for successful achievement. This ensures the acquisition of the necessary skills for employment and education.
5. Criterion-referenced testing procedures are used to evaluate student performance. A criterion-referenced measure is developed for each competency, and student performance is compared to a set standard. Student performance is evaluated to the pre-determined standard rather than compared to other students' work.
6. Student achievement is recorded for purposes of articulation, pre-employment and permanent records. A system is used to document the competencies achieved by each student. This information is critical to the student, teacher, and future employer.

Helpful

7. Individualized materials and methods are used in instruction. The use of individualized materials and methods is

very helpful when students have varied backgrounds and needs. Modules and learning activity packages normally are used when instruction is individualized to meet the needs of the student.

8. Learning time is flexible. The student's rate of learning determines the time required to complete the program. Thus, slower students are permitted to take additional time to gain competencies, while students who learn quickly can proceed to advanced content.
9. Learning is guided by feedback. Frequent or immediate feedback is provided to the student while learning is taking place. Self-check lists and other assessments are incorporated into the instructional materials. Students have an opportunity to be evaluated when they are prepared rather than at scheduled intervals.

Benefits of CBE

As an instructional system, competency-based education has certain advantages and benefits for vocational programs. While many of these advantages and benefits may be found in traditional instructional systems, CBE can enhance the instructional system through improved organization and documentation. Therefore, learning and occupational success can more likely be realized because of the following advantages and benefits:

1. CBE ensures role-relevant, up-to-date programs and course content. The use of task analysis and periodic reviews by advisory committees provides the necessary relevant course content information. This ensures that the correct skills, knowledge and attitude are being taught in the program.
2. CBE specifically identifies role-relevant performance standards and requirements. By involving the advisory committee and industry in setting program/course criteria, the instructor can establish specific performance requirements for the program. This will ensure that the student can meet the expectations of employers when applying the skills and knowledge gained in the vocational program. The involvement of industry and local advisory committees supplements the teacher's experience.
3. CBE facilitates articulation between secondary and post-secondary education. The documentation of course competencies and set standards assists other faculty in determining what a student has achieved in a previous program

or course. Many articulation agreements are based on the use of competency profiles and established standards.

4. CBE improves evaluation since it is based on criterion-referenced testing. The relationship between course grades and performance is improved through the use of criterion-referenced testing. Students and industry are better informed as to specific course evaluation criteria and testing procedures.
5. CBE improves record keeping and documentation of student achievement. The competency record/profile maintains an accurate documentation of achievement for each learner. These records are valuable for program articulation, permanent student records and preemployment information.
6. CBE improves faculty/student communication concerning course goals and requirements. By sharing course objectives and competency profile information with students prior to instruction, the instructor communicates to students a better understanding of course requirements. The use of performance objectives will allow the instructor to share course content and standards for performance with learners.
7. CBE improves program/course accountability to parents and students. The involvement of industry, business, and advisory committees in determining program/course content aids in making a vocational course more relevant. The task analysis/validation procedure ensures that course content is up-to-date and that the student is well prepared.
8. CBE assists in the overall improvement of the educational product -- THE STUDENT. The CBE instructional approach and its accompanying characteristics enable the vocational student to be well prepared to assume a place in the industries, businesses, schools, and society of the state.

Definitions and Terminology

Before discussing the development and implementation of competency-based education in vocational and adult programs, a knowledge of the basic definitions and terminology used in CBE is necessary. It is suggested that all educators and administrators use these terms and definitions in meetings, seminars, workshops, and courses when referring to competency-based education. The following Suggested List of Terms and Definitions (1979) was approved by the Virginia Department of Education:

ARTICULATION. A planned process within an educational system that coordinates instructional programs which will enable students to move from one instructional level to another, or from one institution to another at the same instructional level, without unnecessary duplication or gaps in the instructional program.

CHECKLIST. A list of activities or behaviors that are checked by a student, teacher, or observer as being completed during a particular observation session; frequently used to assess student performance in the psychomotor and affective domains of learning.

COMPETENCY. Demonstrated ability (including knowledge, skills, or attitudes) to perform a specific task successfully to meet a specified standard.

COMPETENCY-BASED EDUCATION (CBE). Educational programs in which required knowledge, skills, and attitudes are based on role-relevant competencies.

COMPETENCY-BASED EDUCATION STANDARDS. Standards for CBE in Virginia are as follows: (1) role-relevant competencies that include standards are identified and stated; (2) competencies are specified to students prior to instruction; (3) criterion-referenced measures are used to measure achievement of competencies; and (4) a system exists for documenting the competencies achieved by each student.

COMPETENCY RECORD/PROFILE. A document that provides specific information concerning achievement of competencies in a CBE course or program, including the following information: student name, program title, listing of all terminal competencies, enabling competencies if required, rating scale, and method for authenticating the record.

CONTENT/CONCEPT. A distinct grouping of tasks which are related to each other by the nature of the activity to be performed.

CRITERION (Criteria). The standard required for a student to reach mastery of an objective.

CRITERION-REFERENCED MEASURE (CRM). A test, test item, or a statement which describes how a student will be tested and/or evaluated. The CRM is based on the task/competency standard or criterion. Criterion-referenced measures may include the standard or criterion as illustrated in the following examples:

Examples: Psychomotor

Tune an adjusted carburetor in accordance with the manufacturer's specification within 45 minutes.

Cognitive

Identify nine out of ten technical terms used in masonry on a written test.

Affective

Exhibit positive attitudes in the vocational classroom and laboratory. Your attitudes will be evaluated by the "Program Attitude Checklist."

CRITERION-REFERENCED TESTING. A process of testing which yields measurements that are directly interpretable in terms of specified performance standards. An individual's performance is compared to a criterion, the criterion being the work or performance standard. Therefore, criterion-referenced testing is based on absolute standards stemming from the competency rather than relative standards such as class standing. (Also called criterion-referenced evaluation, objective-referenced testing, proficiency testing, or a domain-referenced testing.)

CURRICULUM: All the objectives, content, and learning activities arranged in a learning sequence for a particular instructional area. An orderly arrangement of integrated topics, activities, and experiences which students pursue for the attainment of a specified educational goal.

DUTY. One of the distinct major activities or units involved in the work performed in an occupation (i.e., Job-Duty-Task-Step).

ENABLING OBJECTIVE. An objective that identifies one thing a learner must be able to know or to do to perform the performance objective.

ENTRY-LEVEL SKILLS. The set of competencies required of a beginning worker in an occupation for immediate productivity upon entering that occupation.

JOB/OCCUPATION. The composite of duties and tasks performed regularly in one's trade, occupation, or profession (i.e., Job-Duty Task-Step).

INSTRUCTIONAL ACTIVITIES. Educational activities completed by the students to learn specific competencies. (Also called learning strategies.)

INSTRUCTIONAL RESOURCE GUIDE. A document that includes detailed information for developing competency-based courses and programs. The guide includes information concerning the occupational or program domain, task list, performance and enabling objectives, criterion-referenced measures, learning activities, tools/materials, references, program and course descriptions, course content outlines, classroom management systems, student recording systems, and additional resources.

OCCUPATIONAL DOMAIN. A group or listing of occupations within a vocational area that share common experiences, knowledge, and skill requirements such as manufacturing occupations and construction occupations.

PERFORMANCE. A clear statement of what the learner will be able to do after mastery status has been obtained.

PERFORMANCE GUIDE. A listing of steps in sequential order which the student must perform in achieving an objective.

PERFORMANCE OBJECTIVES. A statement, in precise measurable terms, of a particular behavior to be exhibited by a learner under specified conditions. It possesses each of the elements or characteristics specified below:

- a. Condition. The performance situation confronting the learner is clearly specified. This specification includes equipment provided or withheld, environmental constraints such as temperature, space, etc.
- b. Performance. The specific behavior expected of the learner is stated.
- c. Standard (Criterion). The degree of acceptable performance is specified. This may be quantitative, qualitative, or both. If quantitative, 100 percent proficiency is assumed unless otherwise stated. In the standard ". . . locate shorts in an ignition system," it is assumed that all shorts must be located, compared to ". . . locate three or four shorts existing in an ignition system." If qualitative the standard is explicitly stated, e.g., ". . . measure the bearing to within .005 of that found by the instructor."

If the measure of quality is highly subjective, the instructor is assumed to be the judge of acceptable performance unless otherwise stated.

STANDARD. That part of a performance objective or of a criterion-referenced measure which describes how well or to what proficiency level a task must be performed. (Also called performance level, criterion, or work standard.)

STEP. The smallest aspect of a skill; a very specific level in the hierarchy of a job (i.e., Job-Duty-Task-Step); simple abilities needed to do a more complex task.

TASK. A unit of work activity or operation that constitutes a logical and necessary step in the performance of a duty.

<u>Job/Occupation</u>	<u>Duty</u>	<u>Task</u>
Example: Secretarial	Performing computational clerical activities	Complete monthly statements for customers from invoices

TASK ANALYSIS. An organized method for identifying roles, responsibilities, and jobs performed by workers in an occupation or content in nonoccupational courses. Task analysis is used in CBE to establish instructional content and scope.

TASK LIST. A list of tasks performed by workers in an occupational domain (also called job inventory) or what is required to be taught in a nonoccupational course (industrial arts, general business, exploratory, etc.).

VALIDATION. A procedure used to determine and verify if tasks/competencies identified for a vocational program are valid.

Requirements for CBE Programs

The definition, standards, and characteristics of competency-based educational programs have been identified. Then, what is required for a competency-based vocational program? The answer is contained in the Virginia Vocational and Adult Education CBE Standards: Requirements and Criteria (1980) which provides a description of the minimum requirements and criteria for meeting state standards for CBE.

The first standard is the basis for all successful competency-based programs:

ROLE-RELEVANT COMPETENCIES THAT INCLUDE
STANDARDS ARE IDENTIFIED AND STATED.

To comply with this standard, two products are required: a validated task/competency list for the program and a performance objective for each task/competency identified. The task/competency list for the program should include role-relevant competencies based on V-TECS, IDECC, IA (Industrial Arts) Competency Catalogs, state approved lists or other research-based materials. When a research-based or validated list is not available, then appropriate validation techniques must be used.

The second requirement, a performance objective for each validated task/competency, can be selected or developed by the teacher. Performance objectives are contained in several state curriculum guides. Performance

objectives should be developed for all content in the psychomotor, cognitive, and affective domains. These objectives must comply with the definition for performance objectives provided by the Virginia Department of Education. Specific information, details, and examples may be found in SECTION II of this guide.

The importance of informing students of requirements and expectations prior to instruction is recognized as an important strategy of successful teaching. The second state CBE standard addresses this strategy:

COMPETENCIES ARE SPECIFIED TO STUDENTS
PRIOR TO INSTRUCTION.

This standard requires that a system or procedure be developed to provide specific information concerning the competencies which are included in a program, course, or unit of instruction. This information must be shared with the student prior to instruction and may be provided in the form of performance objectives, competency profiles, checklists, training plans, or contracts. Examples of CBE instructional systems and materials are included in SECTION III of this guide.

Competency-based educational programs use criterion-referenced testing methods to determine student achievement of the competencies. Therefore, the third CBE standard requires criterion-referenced testing:

CRITERION-REFERENCED MEASURES ARE
USED TO MEASURE ACHIEVEMENT OF
COMPETENCIES.

Therefore, a criterion-referenced measure, a test item, test, or a statement on how testing and evaluation will be conducted is required for each validated task/competency. Additionally, the testing and evaluation procedure must be based on the criterion or standard contained in the performance objective rather than on the achievement of other students in the program. Specific information concerning criterion-referenced testing is included in SECTION IV.

The fourth and final CBE standard deals with the recording and documentation of competencies achieved by students:

A SYSTEM EXISTS FOR DOCUMENTING COMPETENCIES ACHIEVED BY EACH STUDENT.

The benefits of a documentation system for vocational and adult programs are many. The primary benefit is to the student who receives a detailed record of his/her achievement of the competencies, a record which can be used for pre-employment interviews. This record or profile may also be used for articulation of students between programs, schools, and academic levels.

This fourth CBE standard requires that the record or profile include the student's name, program title, listing of all terminal competencies, rating scale, and a method for authenticating the record. It is suggested that the task/competency record or profile be placed in the student's permanent official school record. Example competency recording documents are presented in SECTION V of this guide.

The Virginia CBE Standards, requirements, and criteria for vocational and adult programs are summarized in Table I on pages 14 and 15. These requirements and criteria were developed to assist teachers and administrators in interpreting Virginia CBE Standards and providing direction for the development and implementation of CBE. Then, how should a teacher implement the standards and requirements in a vocational program? A summary of the relationship between the Virginia CBE Standards and teaching is presented in Table II, pp. 16-17. Additional information in this table is provided to assist administrators in developing inservice workshops for faculty and staff in a CBE format.

Implementing A CBE Program

How should competency-based vocational programs be implemented? The answer depends on many variables and conditions at the local level. However,

TABLE I

VIRGINIA VOCATIONAL AND ADULT EDUCATION
CBE STANDARDS: REQUIREMENTS AND CRITERIA
(VIRGINIA, 1980)

CBE STANDARDS	REQUIREMENTS	CRITERIA
I. Role-relevant competencies that include standards are identified and stated.	1. Validated task/competency list for each vocational program. 2. A performance objective for each validated task/competency.	1.1 Lists to be based on V-TECS, IDECC, state approved lists, or other researched materials. 1.2 Where researched task/competency lists are not available, appropriate methods and resources will be used to validate the lists. 1.3 Task/competency lists will include role-relevant competencies for occupational, consumer and homemaking, industrial arts, and orientation/exploration experiences. 1.4 Lists should be reviewed by local or state vocational supervisory staff. 2.1 Performance objectives to include the psychomotor, cognitive, and affective domains. 2.2 Each performance objective shall include the condition, performance, and standard for each task/competency.
II. Competencies are specified to students prior to instruction.	1. A system exists for providing task/competency information to students prior to instruction.	1.1 The system will provide specific information concerning the tasks/competencies in a vocational program, course, or unit of instruction. 1.2 The system will include one or more of the following types of information: Performance objectives, competency profiles, checksheets, training plans, or contracts.
III. Criterion-referenced measures are used to measure achievement of competencies.	1. A criterion-referenced measure for each validated task/competency. 2. A criterion-based testing and evaluation procedure which tests the performance objective.	1.1 The CBE is a test item, test, or a statement on how testing and/or evaluation will be conducted. 2.1 The testing and evaluation procedure is based on the predetermined standard for the task/competency as stated in the performance objective rather than on other students' accomplishments.

<u>CBE STANDARD</u>	<u>REQUIREMENTS</u>	<u>CRITERIA</u>
IV. A system exists for documenting the competencies achieved by each student.	1. A system that has task/competency records/profiles for student achievement in each vocational program, course, or unit.	1.1 The task/competency records/profiles will include: (a) student name (b) program title (c) listing of all terminal competencies (d) enabling competencies if needed (e) rating scale (f) method for authenticating record 1.2 The documentation is available for articulation, student achievement record, and employer information. 1.3 Task/competency records/profiles should be part of the students' official school records.

TABLE II

IMPLEMENTING THE VIRGINIA CBE STANDARDS IN VOCATIONAL
PROGRAMS AND INSERVICE WORKSHOPS
(Horne and Bell, 1981)

CBE STANDARD	VOCATIONAL PROGRAMS	INSERVICE WORKSHOPS
Role-relevant competencies that include standards are identified and stated.	<u>The teacher would:</u> 1. Ensure that course content is based on validated competencies identified for the occupational or content domain. The task/competency list included in the state Competency-Based Instructional Resource Guide would be reviewed and used for making the course role relevant. 2. Develop and validate a task inventory for those programs/courses when a state instructional resource guide is not available. 3. Select or develop performance objectives for each course.	<u>The workshop leader would:</u> 1. Ensure that workshop activities are based on the specific needs of the participants or objectives identified by a needs assessment procedure. 2. Identify competencies to be achieved in the workshop. 3. Develop specific performance objectives which include a standard or criteria.
Competencies are specified to students prior to instruction.	<u>The teacher would:</u> 1. Provide the student with specific information concerning the course content (required competencies). One or more of the following would be used to communicate this information: performance objectives, competency profiles, checksheets, training plans, or contracts. 2. Develop a system or procedure for disseminating information concerning course content (required competencies) and evaluation procedures in all approved courses.	<u>The workshop leader would:</u> 1. Inform the participants of the workshop goals and objectives.
Criterion-referenced measures are used to measure achievement of competencies.	<u>The teacher would:</u> 1. Ensure that all testing and evaluation is based on specific criteria/standards identified for the competencies. 2. Criterion-referenced measures would be developed or selected for each valid competency in the course.	<u>The workshop leader would:</u> 1. Provide evaluation activities based on the criteria/standards established for the workshop. 2. Criterion-referenced measures would be developed for each workshop competency identified.

CBE STANDARD	VOCATIONAL PROGRAMS	INSERVICE WORKSHOPS
A system exists for documenting the competencies achieved by each student.	<u>The teacher would:</u> 1. Utilize the recording management system which documents the competencies achieved by each student in a program, course, or unit. 2. Develop or select student competency recording forms which are useful for student achievement records, articulation, and pre-employment information.	<u>The workshop leader would:</u> 1. Provide a method for recording the competencies achieved by participants. 2. Develop competency recording forms or certificates which indicates successful completion and/or achievement of workshop objectives (competencies).

a thorough understanding of CBE definitions, terminology, standards, requirements, and state criteria is necessary before a teacher or administrator attempts the implementation process. Teachers and administrators should complete a course, workshop, or other in-service activity and/or have previous experience in CBE implementation.

A number of successful methods have been developed for implementing competency-based education in vocational and adult programs. Depending on the extent of CBE implementation in local vocational programs, modification may be required in the following implementation procedure. This implementation procedure is based on a review of literature, discussions with state CBE directors, and experiences gained in Virginia CBE articulation and CBE projects. Additional information concerning each implementation step is provided in this guide.

1. Identify the domain or scope of the program. It is essential that the scope and purpose of the vocational program be identified before materials are collected or instructional materials are developed. For occupational programs in which students are prepared for employment, a domain consisting of the occupational titles for which the training is to be provided needs to be identified. By reviewing employment trends, government statistics, local advisory committee recommendations, and local industry surveys, the occupational domain can be determined. In many CBE occupational programs the domain is defined by Dictionary of Occupation Titles job titles. In vocational programs which do not lead directly to an occupation or are not based on job titles such as industrial arts, general business, and consumer education, the scope of these programs is based on reviewing the purpose and content needs of the program. The purposes and needs for nonoccupational courses are established by working with state staff and other vocational teachers; reviewing results from task analysis; and reviewing the content of the vocational courses which utilize the basic skills, knowledge, and attitudes taught in the general or basic courses. Whether the program is based on an occupation or a set of required basic skills, the domain and scope of the program must be determined. (See SECTION II)
2. Review and obtain appropriate CBE resources. Once the domain and scope for the vocational program has been determined, a review of appropriate CBE resources and instructional materials should be conducted. An Educational Research Information Consortium (ERIC) search may be helpful in identifying materials and resources for the particular programs. There are also a number of state and regional

curriculum centers which may have materials and resources. Presently the Virginia Department of Education is developing a series of instructional resource guides for CBE; therefore a review of what is available in Virginia should be made first. This step can save effort, time, and money in implementing CBE. (See SECTION II and VI)

3. Obtain or develop a task inventory. The review of CBE resources and materials may identify a task inventory or listing of competencies for the vocational program. If a task inventory is not available, then one must be developed which lists all competencies or tasks to be included in the program. The listing of tasks/competencies should be divided into DUTY AREAS or CONTENT/CONCEPT AREAS, which are broad areas of content. Within each DUTY AREA or CONTENT/CONCEPT AREA, be related tasks/competencies are listed. In many programs, there will be six to ten DUTY or CONTENT/CONCEPT areas and a total listing of 150 to 200 tasks/competencies identified for the domain. (See SECTION II)
4. Validate the task inventory. The validation process is perhaps the most important step in CBE implementation. Validation must be carefully planned in order to yield the information necessary for identifying all role-relevant tasks in the vocational program. As a minimum step in the validation process, the local advisory committee should be involved. Validation should include questions and data concerning: (1) Is the task required for the program? (2) Is the task critical for employment? and (3) What is the acceptable level of performance or standard for the task? In addition, the performance criterion/standard should be identified for each task because this information is used to develop performance objectives and criterion referenced tests. (See SECTION II)
5. Develop performance and enabling objectives for each valid task. The development of performance objectives for each task is helpful in identifying the conditions that will prevail when the task is demonstrated and criterion/standard required for the task. In addition to developing performance objectives, enabling objectives should be developed to support the performance objectives. Enabling objectives need only to be complete statements of skills, knowledge, and attitude necessary before a student can successfully demonstrate the task. (See SECTION II)
6. Identify, revise, or develop instructional activities for each task. Instructional activities need to be identified for the objectives that have been developed. A review of learning activities should be conducted to identify those which can be incorporated in the CBE program. Some consideration should be given to a variety of learning strategies and alternate paths of instruction. The type of instructional materials used should also be studied in selecting appropriate activities. (See SECTION III)
7. Develop a CBE instructional management system. CBE involves several unique features and characteristics not normally found in traditional

vocational programs. These features or characteristics--providing for individual differences, criterion-referenced testing, feedback, recording of competencies--require the use of an instructional systems approach. The development of an instructional system will assist the instructor in the classroom management, program organization, instructional planning, and course evaluation. The primary purpose of an instructional system is the efficient organization and implementation of instruction. (See SECTION III)

8. Prepare or procure criterion-referenced testing materials. Before selecting or developing testing materials for a vocational program, the performance criterion or standard for each competency must be clearly identified. Review the performance objective to determine the criterion/standard for the task/competency. Next the criterion-referenced measure (CRM) can be developed or selected. The CRM is a test item, test, or a statement on how testing and/or evaluation will be conducted. (See SECTION IV)
9. Develop a competency recording system. Because of the numbers of competencies identified for many vocational programs and the need for specific course management information, a recording system is required for CBE. The recording system may be used for student articulation between programs and courses, student permanent records, and preemployment information. The systems are sometimes referred to as competency profiles and may include the following: student name, program title, listing of all competencies, rating scale, and method for authenticating the record. It is suggested that competency records become an official school record and, therefore, be as important as the official transcript. (See SECTION V)
10. Implement the CBE program and evaluate the effectiveness. After implementing the program and materials on a competency-based format, the program's effectiveness needs to be evaluated. This information is useful in making improvements in the program and revising materials. CBE programs require periodic evaluation and review to determine whether the program is maintaining its competency-based characteristics. Follow-up surveys of students and employer questionnaires are helpful in determining the effectiveness of the vocational programs. (See SECTION V)

The relationship of the implementation process to the Virginia CBE standards and appropriate sections in this guide are illustrated in Figure 1, on page 21.

The implementation process is intended to assist vocational educators in providing competency-based education at the local level, especially when materials and resources are not available. To further assist with this process, a series of Instructional Resource Guides for Competency-Based Education is currently under development. The 60 guides provide a basis for implementing competency-based education in vocational programs in the Commonwealth. Each guide includes information and materials for many vocational programs. Therefore,

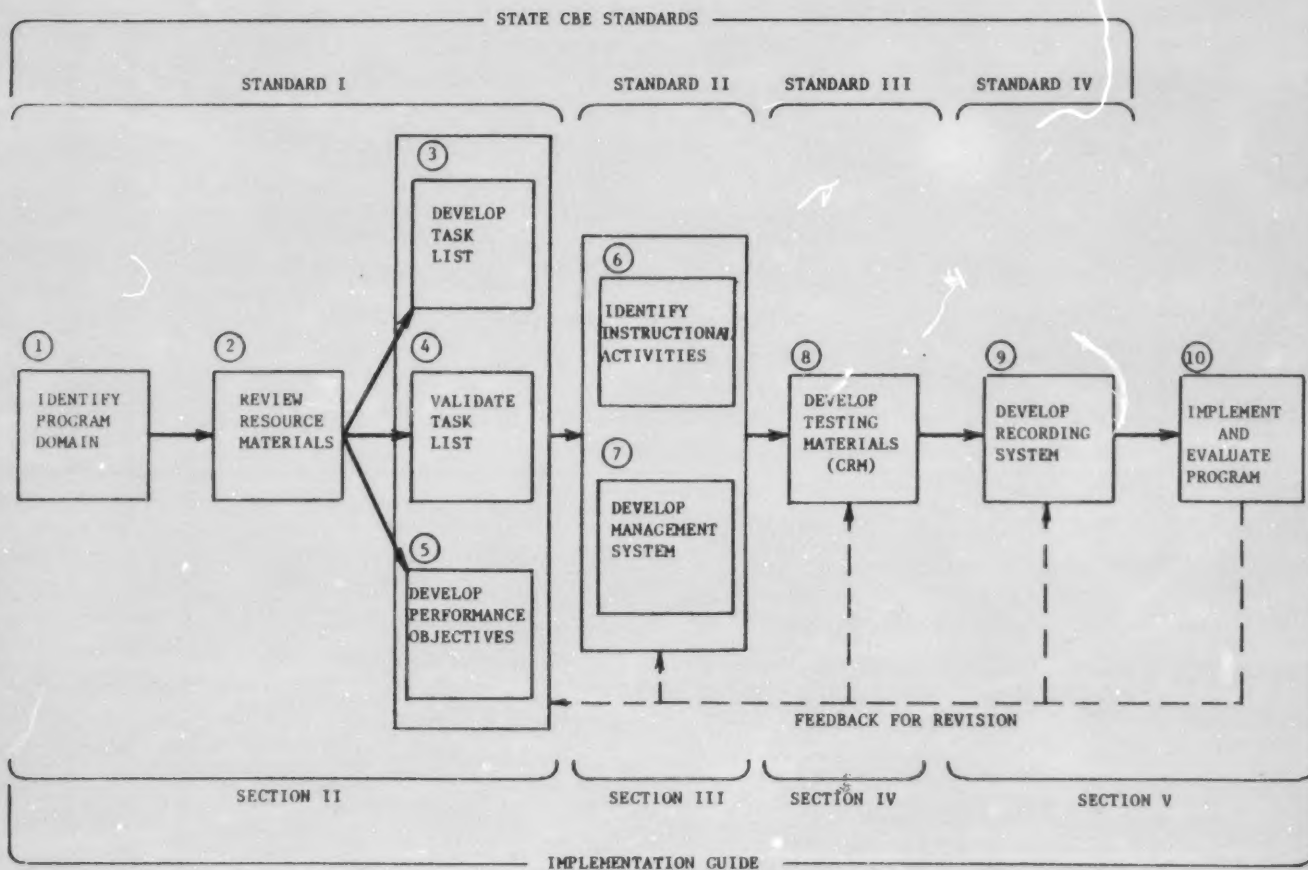


Figure 1

The Relationship of the Implementation Process to the State CBE Standards and Sections in the Implementation Guide

a teacher only needs to review and use a resource guide to implement competency-based education. However, the ten-step implementation process should be used if competencies required at the local level are not included in the instructional resource guides. Specific information concerning the availability of the guides for various vocational programs and their content is presented in SECTION VI.

The implementation process requires careful planning and design to meet the local requirements. An assessment of what requirements for CBE have been met and what materials are available is necessary so that the implementation plan and procedure can be modified. Therefore, a checklist of CBE characteristics and requirements is provided on page 23 to assess current CBE status of course or program. The checklist will help vocational educators in determining which CBE requirements have been met and those needing to be developed for the current program. The assessment will also assist the teacher or administrator in identifying and reviewing the appropriate sections of this guide.

SUMMARY

The major goal of vocational education and competency-based programs is to provide role-relevant instruction in the classroom and laboratory. To assist vocational educators in the Commonwealth to reach and maintain this goal, the Virginia CBE Standards were developed. The standards serve as a framework for developing and implementing CBE in all vocational and adult programs. To assist teachers further, a common listing of terms and definitions is available which helps reduce the confusion over language used in implementing CBE.

Finally, a systematic method for implementing CBE in vocational programs is required. The implementation procedure presented in this guide will assist vocational teachers in developing competency-based programs which provide role-relevant skills, knowledge, and attitudes for youth in Virginia.

CBE IMPLEMENTATION CHECKLIST

The purpose of this checklist is to assist the teacher or administrator in assessing the progress toward implementing competency-based education in a vocational program. Although the items are not all inclusive, they do represent many characteristics and requirements for CBE.

	YES	NO	?
A. Course content is based on validated task/competency lists.			
B. Performance objectives are used in the program or course.			
C. There is a performance objective for each valid task/competency.			
D. Performance objectives include a condition, performance, and standard.			
E. Specific course content and requirements are provided to students prior to instruction.			
F. Criterion-reference measures (CRM) are used in the program or course.			
G. There is a CRM for each valid task/competency.			
H. A criterion-referenced testing procedure is used which tests the performance objectives.			
I. A competency recording system is used to document student achievement in the program, course or unit.			
J. The competency recording system is available for articulation, student achievement records, and employer information.			
K. All required information is included on the competency profile (student name, program title, competency listing rating scale, and authenticating signatures).			
L. CBE programs are reviewed, evaluated, and revised to maintain role-relevancy.			

EVALUATION: A vocational program is competency-based and complies with the Virginia CBE Standards when all items are checked YES.

SECTION II

"Role-relevant competencies that include standards are identified and stated."

In this section, the following CBE implementation steps are presented:

1	IDENTIFY PROGRAM DOMAIN
2	OBTAIN CBE RESOURCES
3	DEVELOP TASK LIST
4	VALIDATE TASK LIST
5	DEVELOP PERFORMANCE OBJECTIVES

One of the major characteristics of competency-based education (CBE) is that program content, instructional activities, and evaluation are based on a set of role-relevant competencies. In vocational programs that prepare students for employment, the competencies are based upon actual worker roles and responsibilities. In programs that do not directly prepare students for employment, such as industrial arts and general business, content is based upon relevant and required competencies needed to meet the goals of the course or program. Therefore, this role-relevant characteristic applies both to occupational and nonoccupational vocational programs.

In Virginia, the first CBE standard deals with the role-relevance of CBE program content:

ROLE-RELEVANT COMPETENCIES THAT INCLUDE STANDARDS ARE IDENTIFIED AND STATED.

The competencies, with standards, will be identified through V-TECS, IDECC, and other appropriate research. Advisory committees should be used to review competencies and standards. Competencies in the affective domain will be included. Role-relevant competencies for occupational preparation programs are those that specifically relate to the occupation for which the student is being prepared as well as to the personal needs of the student. Role-relevant competencies are related also to orientation, exploration, and/or industrial arts experiences which have been identified for students.

The first CBE standard requires two products: a validated task/competency list for each vocational program and a performance objective for each validated task/competency identified for the program.

If the vocational program is based on a current task analysis, V-TECS catalog, IDECC materials, a state competency-based instructional resource guide, or other research-based material, task-analysis procedures may not

be required. However, there may be special local program requirements or regional job differences necessitating the use of task-analysis procedures.

Therefore, role-relevant tasks, called competencies in CBE, must be determined and validated for the vocational program before instructional materials are developed and subsequent instruction can take place. The process by which competencies are identified and selected is called task analysis. The purpose of this analysis is to find out what is required and to identify what is to be taught in the vocational program. In addition, performance objectives must be developed for each task/competency identified and validated by the task analysis procedure.

The identification of competencies, through task analysis, is central to the basic philosophy of CBE. Skill in conducting a task analysis is an essential competency for vocational educators.

In conclusion, the determination of role-relevant competencies is one of the first steps in implementing a CBE program. Thus, the purposes of this section are to assist teachers in:

1. Identifying the vocational program domain.
2. Identifying and selecting competencies for a vocational program by task analysis methods.
3. Validating competencies.
4. Developing performance objectives for competencies.

IDENTIFYING COMPETENCIES

The identification of the program domain and the selection of competencies for a vocational program are the first steps in implementing CBE. The process by which program content is determined is called task analysis. Task analysis is a practical and organized method used to determine the

skills, knowledge, and attitudes required by workers in an occupation or the content for nonoccupational programs. Therefore, the task analysis assists in determining the scope and required content of the vocational program.

The task-analysis process involves five steps: (1) determine occupational or program content domain, (2) collect materials and resources, (3) identify duty or content/concept areas, (4) identify task/competencies within each area, and (5) validate the task/competencies.

The first step of the task-analysis process involves determining the scope of the occupational domain or program domain. The domain may include several related individual job titles. It is helpful to use the Dictionary of Occupational Titles (DOT) in identifying relevant job titles and descriptions in the local area. The occupational domain for a carpentry program might include three job titles: APPRENTICE CARPENTER, DOT 860.381-026; ROUGH CARPENTER, DOT 860.38-042; and MAINTENANCE CARPENTER, DOT 860.281-010. If students are finding employment outside their community, additional job titles should be included in the domain. Instructional resource guides and approved course outlines are sources used to determine the scope or domain of vocational programs that are not directly related to business and industry occupational titles. For example, a drafting program in industrial arts education could include basic technical drawing, architectural drawing, and engineering drawing.

The next activity involves the collection of resources and materials. This step can save time and effort in the task-analysis process since there may be a task list available for the occupational or program domain. Common sources of information are as follows:

1. Local and state curriculum labs

2. University libraries
3. Regional curriculum centers
4. V-TECS and IDECC materials
5. Instructional resource guides
6. Trade associations and unions
7. Governmental agencies
8. Job descriptions
9. Occupational surveys
10. Incumbent worker interviews
11. Student follow-up reports
12. Advisory committee members
13. Consultants

In many task-analysis efforts, more than one source is used to identify the task/competencies for an occupation or program domain.

The next activity involves the listing of broad DUTY AREAS within an occupational domain. The term duty area is defined as: "One of the distinct major activities or units in work performed in an occupation." Several examples of duty areas are these: PERFORMING STRUCTURAL WELDING OPERATIONS, PERFORMING ADMINISTRATIVE FUNCTIONS, OPERATING OFFSET PRINTING EQUIPMENT, TROUBLESHOOTING ELECTRONIC EQUIPMENT, and PERFORMING ACCOUNTING FUNCTIONS. The term CONTENT/CONCEPT is used in those vocational programs which are not directly based on occupations and job titles. Examples of content/concept areas are these: HISTORY OF DRAFTING, BUSINESS CONCEPTS AND TERMINOLOGY, STUDENT ORGANIZATIONS, PERSONAL HYGIENE, and ACCOUNTING PRINCIPLES. The duty and/or content/concept area is very broad and identifies a set of related jobs or tasks actually performed by workers in a given occupation or competencies required in a program.

Most vocational programs may have four to ten duty or content/concept areas. The number of tasks or competencies within a duty or content/concept can vary from 10 to 50, depending on the occupation or scope of the program selected. The identification of appropriate duty or content/concept areas is not as important as ensuring that all tasks/competencies have been included in the task inventory. It is the tasks/competencies that will serve as a basis for developing performance objectives and instructional materials and not the duty or content/concept area categories.

Once the duty or content/concept areas have been identified for the occupation or program, the individual tasks/competencies for each area are identified. A competency is defined as: "Demonstrated ability (including knowledge, skills, or attitudes) to perform a specific task successfully to meet a specific standard." A listing of related tasks/competencies make up a duty or content/concept area. Examples of competency statements are as follows:

SKETCH FLOOR PLANS
TUNE A CARBURETOR
IDENTIFY TECHNICAL BUSINESS TERMS
PREPARE SALADS
INSTALL A PRE-HUNG DOOR
PERFORM BASIC CALCULATIONS
MAKE LEDGER ENTRIES
IDENTIFY MARKETING STRATEGIES

Competency statements do not need to include conditions or standards because this information will be included in the performance objective. When identifying and writing task/competency statements, make them short,

clear, and concise statements which are not subject to misinterpretation or misunderstanding. This concept is important as other individuals may be involved in the validation of the tasks/competencies. The relationship among the occupational/program domain, duty or content/concept area, and task/competency is illustrated in Figure 2, page 33.

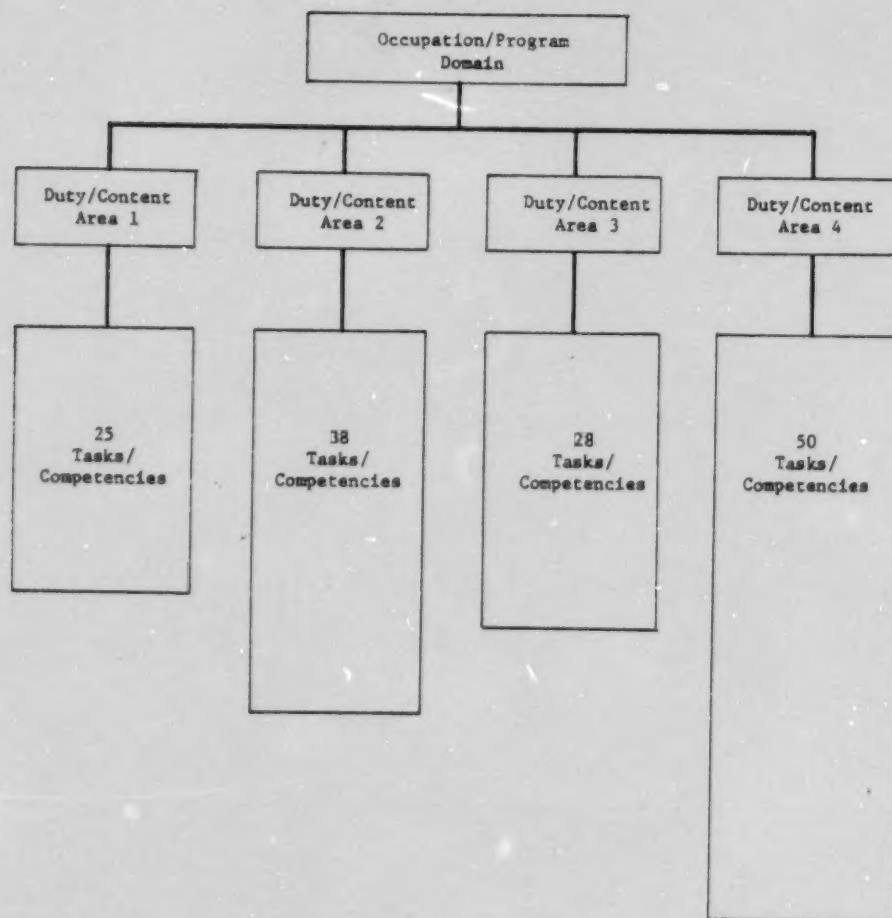
The number of tasks/competencies contained in a given duty/content area may vary from 10 to 50, depending on the occupation or program. Many vocational programs will contain a total of 100-200 tasks/competencies and four to ten duty/content areas.

VALIDATING COMPETENCIES

Once the task list has been selected or developed, it is important that a method be identified for validating the competency information. The validation process is a systematic method to determine whether the competencies listed are correct and relevant for a given occupation or program. Validation is not required if the task list has been recently validated or is based on researched materials such as V-TECS, IDECC or state approved task lists. However, validated task lists should be reviewed to determine whether all local occupational or program needs are included. Validation is essential since the information collected will be used to develop performance objectives and instructional materials for the vocational program.

There are several methods used by teachers and curriculum developers for validating competencies. The most common method involves a survey of workers to determine whether the competency is required within the occupation. Also, the survey technique may be used for vocational programs which are not based on an occupation; other teachers and content experts may be surveyed. Valuable information concerning and related to the competency,

Figure 2
The Relationship Among Task Analysis Terminology

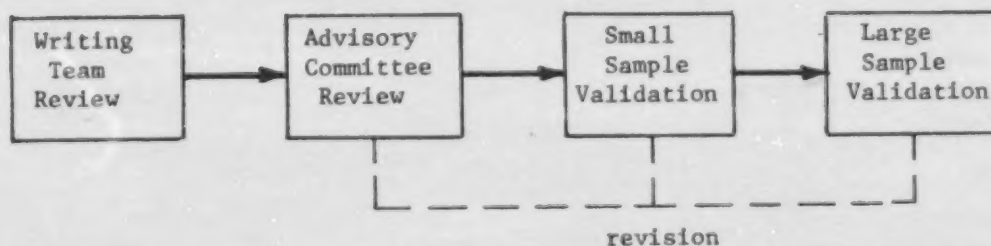


tools, equipment, methods, enabling skills, technical knowledge, and materials can be determined by the survey method. The survey method is used primarily by V-TECS in validating task/competency inventories. It is suggested that the advisory committee be involved in the validation process when using the survey method.

The format of the task inventory is not as important as the information collected. Essential information for the validation process focuses on (1) whether the task is required for employment or for program completion, (2) the amount of time spent performing the task, (3) additional tasks or competencies not included on the inventory, and (4) whether the task is critical for employment or success in the program. Sample task validation forms are shown on pages 47-48.

The first step of the survey method involves a review by the developer or writing team members to determine writing errors and major omissions in the task inventory. After this first review, the local advisory committee should validate the task inventory. Next, at least 10 incumbent workers or content experts should validate the list. Additional workers or content experts may have to be involved if they are not representative of the entire occupational domain or program. The final step involves a survey of at least 25 workers or content experts.

The validation process is illustrated by the following diagram:



In conclusion, the validation process is essential to a truly competency-based course or program. Also, it should be noted that this process may have to be repeated periodically to ensure that the vocational course or program is providing relative and current learning activities.

DEVELOPING OBJECTIVES

Before discussing how to write performance objectives for competency-based education, a definition and rationale for using objectives in vocational programs is provided. According to Mager (1975), "An objective is a description of a performance you want learners to be able to exhibit before you consider them competent." Therefore, a performance objective is really a plan or blueprint for instruction. In Virginia, a performance objective is defined as:

A statement in precise measurable terms of a particular behavior to be exhibited by a learner under **specified conditions**. It contains each of the elements or characteristics specified below:

- a. Condition. The performance situation confronting the learner is clearly specified. This includes equipment provided or withheld, environmental constraints such as temperature, and space.
- b. Performance. The specific behavior expected of the learner is stated.
- c. Standard. The degree of acceptable performance is specified. This may be quantitative, qualitative, or both. If quantitative, 100 percent proficiency is assumed unless otherwise stated. In the standard ". . . locate shorts in an ignition system," it is assumed that all shorts must be located, compared to ". . . locate three or four shorts existing in an ignition system." If qualitative, the standard is explicitly stated, e.g., ". . . measure the bearing to within .005" of that found by the instructor."

If the measure of quality is highly subjective, the instructor is assumed to be the judge of acceptable performance unless otherwise stated.

Thus, the performance objective is a statement which specifies how competency is demonstrated (performance), the situation or environment (condition) in which the performance is demonstrated, and how well (standard) a learner must perform the task/competency to be successful.

Why use performance objectives in competency-based education? There are several reasons for developing and using objectives. First, the performance objective is a plan for instruction which assists the teacher in identifying instructional materials, resources, and learning activities for the vocational program. The development of relevant learning activities for a specific program is difficult if the learning outcomes have not been identified. When reviewing potential instructional materials and resources, the content and scope of the materials must be compared to the purpose and objectives of the program. Thus, performance objectives serve to identify the direction, content, and scope of the vocational program.

A second reason for using performance objectives is that the development of evaluation instruments and procedures is better facilitated. In Virginia, criterion-referenced measures and testing procedures are based on performance objectives, which are required for competency-based education. When being evaluated, it is important that the learner's performance be compared to the same standard or criterion used in the performance objective. Therefore, the performance objective serves as a foundation for developing criterion-referenced testing materials in the vocational program.

Finally, performance objectives assist in communicating the course goals, scope, and outcomes to students, parents, and others. Experience and research have demonstrated that if the learner knows prior to

instruction what is to be learned and what is expected, learning is better facilitated. The performance objective is one method for letting the learner know, prior to instruction, the scope of the program or course and the purpose. Parents are interested in what students are learning in school; therefore, the use of performance objectives will assist in communicating the program content and goals to them. Also, when performance objectives are used, advisory committee members are informed of the content and scope of a program. If the advisory committee is to function successfully, the committee needs the specific content information which can be provided by performance objectives. These evaluations are important for improving programs and for ensuring that state and federal funding is used effectively.

Performance objectives are useful and necessary for competency-based education in Virginia. They really are like a road map for the student and teacher. If the student and teacher know where they are going, there is a good chance of arriving at the intended destination.

Selecting Performance Objectives

Because there are many available resources--V-TECS, state curriculum guides, instructional materials, instructional resource guides, workbooks, and texts which contain performance objectives--criteria for selecting performance objectives will be discussed first. The review and selection of performance objectives from resource materials can save valuable time, thus allowing more time for developing instructional materials and activities.

Five steps should be followed before beginning to write performance objectives:

1. Review V-TECS, IDECC, state curriculum guides, and other appropriate materials for the program.

2. Compare the performance objectives contained in the resource materials with the task/competency list for the program.
3. Select or identify all performance objectives which match a task/competency on the task inventory.
4. Determine whether the selected performance objectives contain condition, performance, and standard elements. The performance and standard for the objective must be consistent with the task/competency identified for the program.
5. Revise or modify those performance objectives which contain appropriate condition, performance or standard element.

Following the above steps for selecting performance objectives should save the teacher valuable time in developing objectives for the vocational program. The important thing to remember is that performance objectives selected from resource materials must correlate directly with the tasks/competencies identified for the vocational program. This means that the same condition, performance, and standard be maintained in the performance objective as stated in the task/competency.

Writing Performance Objectives

When performance objectives cannot be selected for a program, then they must be written. Prior to the actual writing of performance objectives, the type of learning behavior should be identified. According to Johnson and Johnson (1970) learning and performance objectives are classified into three types:

1. The cognitive domain which includes learning such as thinking, understanding, and reasoning skills.

Example: Given a list of ten general accounting terms, correctly identify and define in writing, eight of the terms.

2. The affective domain which includes learning to deal with feelings, attitudes, emotions, interests, and values.

Example: Demonstrate positive worker attitudes on the employment site. Acceptable performance will be demonstrated by a score of 9 on the EMPLOYMENT ATTITUDE CHECKLIST.

3. The psychomotor domain which includes manipulative skill learning that emphasizes "hands on" skills.

Example: Provided with materials, tools, and specifications, frame an interior partition wall. The structure must be plumb, square, and within 1/8" of the plan dimensions.

It is suggested that the vocational instructor review the task/competency list to determine which domains are represented in the program content. Once the instructional domain has been identified, then appropriate terminology for the objectives should be selected. To assist the teacher, Brannan, Day and Maley (1978) have developed a listing of words which are useful when writing performance objectives. The listing is based on work by Krathwohl, Bloom and Masia (1964) and Herschbach (1973). The terminology by instructional domain is provided in Table III, on page 40. Because performance objectives are an integral part of competency-based education, the following points should be considered when writing and selecting performance objectives:

1. Use the task/competency statement as the foundation for the performance objective.
2. Include a condition, performance, and standard in each performance objective.
3. Include only one behavior or performance in the objective.
4. Write in clear and concise language leaving no doubt as to expected outcome.
5. Include measurable standards that can be evaluated.
6. Include only those conditions which can be met by the student.
7. Always use an action verb that specifies observable or measurable performance.

A systematic procedure is helpful when writing performance objectives

TABLE III
INSTRUCTIONAL DOMAIN TERMINOLOGY
(Brannan, Day and Maley 1978)

COGNITIVE DOMAIN

KNOWLEDGE	COMPREHENSION	APPLICATION	ANALYSIS	SYNTHESIS	EVALUATION
define	convert	change	break down	categorize	appraise
describe	defend	compute	diagram	combine	compare
identify	distinguish	demonstrate	differentiate	compile	conclude
label	estimate	discover	discriminate	compose	contrast
list	explain	manipulate	distinguish	create	criticize
match	extend	modify	identify	devise	discriminate
name	generalize	operate	illustrate	design	explain
outline	give	predict	infer	explain	justify
reproduce	example	prepare	outline	generate	interpret
select	infer	produce	point out	modify	relate
state	paraphrase	relate	relate	organize	summarize
	predict	show	select	plan	support
	rewrite	solve	separate	rearrange	
	summarize	use	subdivide	reconstruct	
				revise	
				summarize	

AFFECTIVE DOMAIN

RECEIVING	RESPONDING	VALUING	ORGANIZATION	CHARACTERIZATION
ask	answer	complete	adhere	act
choose	assist	describe	alter	discriminate
describe	comply	differentiate	arrange	display
follow	conform	explain	combine	influence
give	discuss	form	compare	listen
hold	greet	initiate	complete	modify
identify	help	invite	defend	perform
locate	label	join	explain	propose
name	perform	justify	identify	qualify
point to	practice	propose	integrate	question
select	present	read	modify	revise
sets erect	read	report	order	serve
reply	recite	select	organize	solve
	report	share	synthesize	verify

PSYCHOMOTOR DOMAIN

SIMPLE	COMPLEX	ADAPTING	ORGANIZATION
grind	coordinate	adjust	create
saw	manipulate	correct	formulate
clean	set-up	adapt	generate
make	regulate	convert	form
hook	measure	alter	design
stir	integrate	combine	invent
drill	combine	fit	construct
start	correct		develop
hammer			
bend			

for vocational programs. Therefore, the following steps are suggested for developing performance objectives:

1. Determine the type of learning required to accomplish the task/competency. Study the task/competency statement to determine whether the objective to be written is in the affective, cognitive, or psychomotor domain. This will assist in using appropriate terminology and selective evaluation techniques. Terminology may be selected from the listing on page 40.
2. Identify and write the condition element of the performance objective. Successful demonstration of a task/competency is dependent upon the conditions, circumstances, or restrictions imposed. The condition element of a performance objective must be realistic in terms of the task/competency and be within the scope of the program requirements. Examples of condition elements for performance objectives are as follows:

Given a list of technical terms. . .

Provided with specifications, tools. . .

In a simulated office environment. . .

Without a procedure checklist. . .

3. Identify and write the performance element of the performance objective. Study the task/competency statement and use the same wording or action verb. An action verb such as define, draw, identify, weld, demonstrate, or construct is used to identify the type of performance which must be demonstrated to meet the intended outcome. Thus, in writing the second element or part of a performance objective, the following statements are appropriate:

. . .define the technical terms. . .

. . .construct an ellipse. . .

. . .install a. . .

. . .repair the alternator. . .

4. Identify and write the standard/criterion element of the performance objective. The standard or criterion for the task/competency is next identified and included in the performance objective. The standard must be stated in measurable terms such as the number of errors permitted, the degree of accuracy expected, the time allowed for performing the task/competency, or a combination of several standards.

The following examples illustrate the last element of a performance objective:

- . . . 9 out of 10 must be identified.
- . . . within 25 minutes.
- . . . according to GM Shop Manual Specifications.
- . . . 40 wmp with one error.

5. Review all three elements of the performance objective. Compare the written performance objective with the original task/competency statement to check whether appropriate condition(s), performance, and standard(s) elements are included. The technical terminology and structure of the wording should be reviewed also. It is sometimes helpful to have others read the performance objective to determine whether the intent is communicated clearly.

Examples of performance objectives in the cognitive, affective, and psychomotor domains are provided for various vocational programs on pages 49-51.

SUMMARY

The Virginia CBE Standard I, "Role-relevant competencies that include standards are identified and stated," is the basis for a competency-based vocational program. The major element in all CBE programs is the listing of role-relevant competencies. Whether the vocational program is occupational or nonoccupational, the required content or competencies must be identified and validated. The use of task analysis is one method for determining what should be taught in the vocational program. The development of performance objectives is based on the validated task list. The task list and performance objectives serve as a foundation for the competency-based vocational program.

However, it should be noted that other major efforts have already identified valid competencies and performance objectives for vocational programs. Therefore, resources and materials are available in most

service areas; it is recommended that teachers review what has been developed before beginning to identify tasks and write performance objectives. It is the purpose of this section to assist teachers in developing task inventories and performance objectives only if these products are not available for the vocational program.

CBE STANDARD I CHECKLIST

The purpose of this checklist is to assist the teacher or administrator in determining whether a vocational program complies with the requirements and criteria of CBE standard I: "Role-relevant competencies that include standards are identified and stated."

- A. There is a validated task/competency list for each vocational program.
- B. Performance objectives use the same performance and standard required in the task/competency.
- C. When research-based task/competency lists are not available, appropriate validation methods are used.
- D. There is a performance objective for each valid task/competency.
- E. Performance objectives in the cognitive, affective, and psychomotor domains are included in the program.
- F. Each performance objective includes the condition(s), performance, and standard(s).
- G. Performance objectives are stated in clear, concise, and measurable terms.
- H. If V-TECS, IDECC, state approved lists or research materials are available, the program task/competency list is based upon these materials.

YES	NO	?

EVALUATION: A vocational program complies with Virginia CBE Standard I, when all items are checked YES.

SAMPLE MATERIALS

SAMPLE TASK VALIDATION FORM *

PROGRAM: Consumer and Homemaking--Management and Family Economics		Page 1 of 1 Pages	
Dear Homemaker: 1. Check tasks you perform now (✓). 2. Add any tasks you do now which are not listed. 3. In the "Time Spent" column, indicate the time spent by placing the appropriate number.			
Time Spent Scale 1 - VERY MUCH BELOW AVERAGE 4 - ABOUT AVERAGE 7 - VERY MUCH ABOVE AVERAGE 2 - BELOW AVERAGE 5 - SLIGHTLY ABOVE AVERAGE 3 - SLIGHTLY BELOW AVERAGE 6 - ABOVE AVERAGE			
CONTENT/CONCEPT: Managing Financial Resources (Family Income)		CHECK IF REQUIRED IN PROGRAM	TIME SPENT DOING THESE TASKS
TASKS:			X
1.1 Determine total income			
1.2 Determine total expenses			
1.3 Prepare family budget			
1.4 Balance income with expenses			
1.5 Establish a system of filing household records			
1.6 Pay bills on periodic basis			
1.7 Select bank			
1.8 Balance bank statement			
1.9 Prepare an investment plan			
1.10 Obtain credit cards			
1.11 Purchase health insurance			
1.12 Purchase life insurance			
1.13 Purchase major appliances and vehicles			
1.14 Purchase motor vehicle insurance			
1.15 Purchase items on installment			
1.16 File for homestead exemption			
1.17 Fill out income tax exemptions form (W-4)			
1.18 Prepare income tax return			
NOTE: Check column "X" if task is critical for success			

OCCUPATIONAL AREA: APPAREL & ACCESSORIESCODE: 0202LEVEL: SUPERVISORYPAGE: 19 of 26

AREA OF RESPONSIBILITY	TASK	1 = Not Applicable	2 = Nice to Know	3 = Should Know	4 = Must Know
Select Merchandise/Services:	13. Select appropriate products/merchandise/services to promote congruent with objectives of the firm. 14. Select merchandise that is seasonal, timely, and in keeping with promotional objectives. 15. Demonstrate knowledge of prices, available sizes, colors, styles or models of merchandise being advertised to better promote the merchandise. 16. Demonstrate knowledge of the supply of merchandise available to back up an ad effectively.				
Select Media and/or Promotional Method:	17. Select media and/or method most appropriate to promote apparel and accessory products/merchandise/services. 18. Determine appropriate media for advertisement (newspaper, radio, TV, yellow pages, or special flier). 19. Determine when to use special promotions such as style shows. 20. Determine when to use displays. 21. Coordinate local advertising with chain, regional, or national advertising. 22. Conduct seminars, training sessions, clinics, or fashion shows for customers. 23. Determine what media is available from suppliers.				
Develop Advertisements for Various Media:	24. Prepare information for advertisement copy that will create customer desire.				

SAMPLE PERFORMANCE OBJECTIVES

The following performance objectives are representative of the vocational programs identified:

AGRICULTURAL EDUCATION

Cognitive Domain

After completion of a lesson on agricultural law, identify the four most commonly used defenses for farm liability situation.

Affective Domain

By the time the FFA members are Chapter Farmers, they will be able to demonstrate 6 of the 9 principles of parliamentary procedure listed on pp. 33-34 of the Agricultural Science and Mechanics I and II, Virginia Curriculum Guide.

Psychomotor Domain

Provided with a small gas engine, tools, and specifications, set the ignition points in accordance with the manufacturer's specifications.

BUSINESS EDUCATION

Cognitive Domain

Given a list of 20 items, classify, without error, each item as an asset, liability, or owner's equity.

Affective Domain

After instruction on employee human relations skills, demonstrate positive employee relationships in office simulation settings. An average score of 7 is required on the EMPLOYER APPRAISAL FORM.

Psychomotor Domain

Given 15 documents for filing and filing directions, correctly index, code, sort, and file alphabetically all 15 documents.

DISTRIBUTIVE EDUCATION

Cognitive Domain

Provided with information on marketing strategies and factors which affect marketing strategies, demonstrate your knowledge of marketing strategies on a written test. Successful achievement will be realized with a score of 75% on the marketing test.

Affective Domain

Demonstrate effective employer-employee interpersonal relations on the job-training site. A passing score of 90 must be achieved on the EMPLOYER APPRAISAL FORM.

Psychomotor Domain

Given a total cost for a purchase and the amount of money submitted by the customer, count back the correct change due. All items on the teacher-coordinator checklist must be performed correctly.

HEALTH OCCUPATIONS EDUCATION

Cognitive Domain

Provided with instruction on the needs of the newborn, identify and discuss the emotional, nutritional, and safety needs of the newborn. Successful achievement will be realized with a score of 85% on a written test.

Affective Domain

Given instruction on basic employability skills and attitudes, demonstrate your ability to work with other nursing staff and the supervisor in the clinical setting. Acceptable performance requires a score of 95% on the Clinical Rating Scale.

Psychomotor Domain

After adequate instruction/demonstration, provide safe nursing care to the postpartum maternity patient. Acceptable nursing care will be demonstrated with a score of 70% on the Clinical Performance Rating Scale.

HOME ECONOMICS EDUCATION

Cognitive Domain

Provided with consumer information and three products, select the "best buy" product, based on the consumer information. Your choice must match the product selected by the instructor.

Affective Domain

Given appropriate reference materials, write your personal philosophy of child development, based upon the various philosophies found in the reference materials and your own feelings.

Psychomotor Domain

After observing the instructor correctly demonstrate methods for storage of woolen garments, store woolen garments. Successful achievement will be realized by a passing score on the instructor's checklist.

INDUSTRIAL ARTS EDUCATION

Cognitive Domain

Provided with information on working drawings used in construction, identify foundation drawings and details. The foundation drawing must be selected from a set of working drawings and all foundation details identified.

Affective Domain

After instruction on shop behavior and safety, demonstrate positive behavior and safety attitude when working in the shop. Positive attitude will be demonstrated when 9 out of 10 items are rated ACCEPTABLE on the instructor's checklist.

Psychomotor Domain

Given silk screen stencil materials, tools, and stencil specifications, prepare a film stencil for the silk screen process. The stencil must reproduce a readable screen print in accordance with the instructor's rating scale.

TRADE AND INDUSTRIAL EDUCATION

Cognitive Domain

Given a list of technical terms and definitions used in masonry, match the term with the definition. Nine out of ten terms must be matched correctly.

Affective Domain

Demonstrate neat and safe work habits in the wood shop and cooperative work site. You must receive a score of 8 on the STUDENT WORK HABITS RATING FORM and an acceptable rating from the supervising employer.

Psychomotor Domain

Given range circuit current demand data and layout specifications, install a range circuit. The installation must comply with all electrical codes and accepted trade workmanship practices.

SECTION III

"Competencies are specified to students prior to instruction."

In this section, the following CBE implementation steps are presented:

6	DEVELOP INSTRUCTIONAL MATERIALS
7	DEVELOP MANAGEMENT SYSTEM

Competency-based education in Virginia is defined as:

Educational programs in which required knowledge, skills, and attitudes are based on role-relevant competencies with specific standards.

Therefore, a question may be asked concerning methods of instruction used in competency-based education. Does CBE require the use of a particular instructional method such as individualized instruction? The answer is no. Competency-based education is not a specific delivery method; CBE is a system of ensuring that what is taught is role-relevant and required for success in employment and education. The concept of basing the vocational program on role-relevant content is not unique nor just a requirement of CBE. All vocational programs should include the required and appropriate knowledge, skills, and attitudes. Therefore, the same instructional methods and materials, if based on role-relevant competencies, in the current vocational program can be successfully used in CBE. It is the content base of the vocational program and not the specific instructional delivery method used which is important. In other words, it is not how a teacher teaches, but what is taught that is important in CBE.

However, the second Virginia CBE Standard does deal with instructional methodology for vocational programs:

COMPETENCIES ARE SPECIFIED TO STUDENTS PRIOR
TO INSTRUCTION.

This CBE standard requires a system or method for providing task/competency information to students prior to instruction. The information to be shared with the student must be specific and should include information concerning **course content** and evaluation criteria or standards. The information can be provided to the student by using performance objectives, competency profiles, checksheets, training plans, or learning contracts. Thus, the second CBE

standard requires that specific information concerning the tasks/competencies for a vocational program be shared with students prior to instruction. However, the CBE standard does not require any particular method of dissemination.

Therefore, the purpose of this section is as follows:

1. Discuss the relationship between CBE and individualized instruction.
2. Discuss and illustrate successful methods of instruction used in competency-based vocational programs.
3. Provide information on selecting instructional materials for CBE.

CBE AND INDIVIDUALIZATION

One of the major misconceptions concerning competency-based education in Virginia is the idea that CBE requires individualized learning methods and the use of modules. Individualized learning is a successful method of instruction; however, it is not required nor is a necessary component of CBE. In reviewing the State CBE Standards, there is no mention of individualized instruction nor any other method of instruction. Perhaps the idea that CBE and individualized instruction are synonymous results because several characteristics of CBE also are characteristics of individualized instruction. These characteristics, use of performance objectives, preassessment of students, set performance standards, and varied learning activities sometimes are common to both CBE and individualized learning. Although not all of these characteristics are required for CBE, they usually are included in the instructional program.

Another difficulty in understanding individualized learning as it

relates to CBE is the problem in defining individualized instruction. There are many definitions for individualized instruction and various lists of characteristics. According to Pucel and Knaak (1975):

Individualized instruction attempts to adapt the educational program to the specific needs of a student. It is aimed at assisting the student to develop from the point he is at currently to a place he would like to be in the future. (1975:10)

Individualized instruction really is a method for placing students in a vocational program based on previous learning and tailoring the instruction to meet the students' individual needs.

Although it is difficult to define individualized instruction and there are considerable differences among programs, the following characteristics usually are found in these programs:

1. Students are pretested to determine the skills, knowledge, and attitudes they possess upon entry into the vocational program.
2. The learning time is flexible to allow students to learn at their own rate.
3. Different learning styles are accommodated because students learn in different ways.
4. Performance objectives are developed, and student performance is compared to set standards.
5. Instructional materials are designed to allow for individual learning rather than group learning.
6. Immediate feedback and evaluation are provided.

Individualized instruction encompasses many characteristics and concepts which are sometimes included in CBE. However, the major emphasis of individualized instruction is on learning and delivery of instruction while CBE emphasizes program content and documentation. Individualized instruction is a successful technique that sometimes is utilized in competency-based

vocational programs. The important point to remember is that individualized instruction is a valid instructional method but not a requirement of competency-based vocational programs in Virginia.

INSTRUCTIONAL METHODS FOR CBE

There are many different instructional methods currently used in vocational education. Competency-based education does not change nor reduce the need for successful instructional methods and strategies but ensures that the content is correct for the overall goals of the vocational program. Whether large group, small group, or individual methods are used depends on the program content, student population, facilities, and teachers' abilities.

Then, what are some of the successful instructional methods used in competency-based education? The answer is dependent on (1) type of vocational offering (orientation, exploration, or occupational preparation); (2) vocational program area (industrial arts, trade and industrial, consumer and homemaking, etc.); (3) student characteristics; and (4) program content. Based on these factors and other considerations, the following instructional methods and strategies have been implemented successfully in vocational education:

1. Lecture and Laboratory Instruction. The course content is divided into a series of competencies or units of instruction. Group discussions and lectures provide content involving cognitive skills and information concerning job procedures, safety, and technique. The psychomotor or application of skills is taught in the laboratory or shop. Students progress through the program as a group. Some independent and individualized instruction may be used.
2. Learning Activity Packages (LAP). The LAP system of instruction divides the course content into a series of individual learning packages which include one or several competencies. The learning activity package usually contains a pretest, performance objective(s), learning activities, self-checks, and a posttest. Students progress at their own rate, and instruction can be tailored to fit individual

needs. LAPS may also be used in a group instruction format. The LAP system is used successfully in distributive education and other vocational areas. An example from a LAP is shown on pages 69-70.

3. Competency Activity Sheets. A method which assists the vocational instructor in organizing learning and evaluation activities. The competency activity sheet is similar to a job sheet. The following components are included on competency activity sheets: (1) competency statement, (2) performance objective, (3) enabling objectives, (4) learning activities, (5) evaluation techniques, and (6) criterion-referenced materials. The competency activity sheets assist the teacher in providing individualized programs for students, allow for self-pacing, and organize various instructional materials and activities. A sample competency activity sheet is included on page 71.
4. Job or Operation Sheets. A method of instruction which provides specific information for the student on how to complete a job or skill required in the vocational program. Competencies requiring "hands-on" skill usually are taught in the shop environment, and a job sheet facilitates this type of instruction. Job sheets may include (1) competency or skill to be performed, (2) material required, (3) tools and equipment needed, (4) procedure or operations, (5) safety considerations, and (6) evaluation information. Normally, job sheets are used with other methods of instruction in vocational programs. A job sheet is illustrated on page 72.
5. Modules. A self-contained unit or package including information, learning activities, and evaluation required to learn a specific competency or unit of instruction. Modules allow for self-pacing and individualization of programs. A vocational program using modules or self-contained packages as the major instructional method is called a "modularized" course. Modules are available for most vocational programs or courses.
6. Programmed Instruction. An auto-instructional method in which subject matter is arranged into a series of small steps. Cognitive information is structured into a series of frames or steps with answers. The student works through the program by responding to the questions. Immediate feedback and reinforcement is provided to the students. Program booklets are either "linear" or "branched", depending on the subject matter and complexity of the programs. A sample linear program for drafting is provided on page 73.
7. Individualized Learning. A method which assesses the student prior to learning and adjusts the program to fit the student's needs. A variety of learning materials and methods are used to meet individual learning styles. Self-pacing and the use of modules or learning activity packages usually are in individualized vocational programs. Because individualized instruction varies among programs and educators do not agree on definitions, there may be other characteristics.

8. Simulations. A technique which uses a role-playing model to teach competencies that are required in real-life situations. There are various types of simulation: simulation games, task simulation, position (job) simulation, and model office (flow-of-work) simulations. This instructional method serves as a motivational device and can help students develop a sense of responsibility toward work. In other words, simulations enable the student to experience situations which are required in the real world setting.

The important point of this discussion is that CBE does not limit or require any particular method of instruction but really allows for many different methods. Any successful method currently being used in the vocational program is appropriate for competency-based education.

CBE INSTRUCTIONAL MANAGEMENT

Vocational programs and courses contain a large number of competencies and related experiences for students to learn over a relatively short period of time. In many programs, a variety of instructional methods and materials are used to prepare students for entry into an occupation or teach the basics for continuing education. Therefore, a systematic approach to the management of instruction is required, especially in competency-based vocational programs. In CBE there are several unique requirements: recording of competencies, informing students prior to learning of the course requirements, and administering criterion-referenced tests, which may not be included in the present vocational program. These requirements and other features of the vocational programs necessitate the use of a management tool. Lesson plans, teaching contracts, or instructional systems are common methods used by vocational teachers to manage the daily instructional activities.

Before discussing the requirements and formats of management materials and systems, a series of questions need to be answered and considered by the teacher:

1. How will students be evaluated and when will the testing occur (pretest, unit tests, when a competency is demonstrated)?
2. Will students learn in an independent or group setting?
3. Will a variety of instructional methods and strategies be used?
4. How and when will student achievement be documented on the competency record?
5. Will there be integrated lecture/lab?
6. How will student organizations (VICA, DECA, FFA, FHA, HERO) be used in the vocational programs?
7. How will slow and fast learners be accommodated?
8. Will students who transfer from another school or program be placed at an appropriate level in the program?
9. How and when will students be informed of course or unit objectives and requirements?
10. How will the content and instructional activities be sequenced in the course?

These are a few of the questions which need to be considered and evaluated before a management system can be designed.

What are some of the more successful methods or systems used to manage a CBE program? Perhaps the answer may be found in reviewing several methods which are currently being used in vocational education:

1. Lesson Plans. The lesson plan is actually a road map for the student and teacher in providing detailed information concerning content, learning activities, procedures, materials required, references, presentation techniques, and evaluation procedures. The plan is valuable also to the vocational supervisor and administrator in evaluating the programs and providing assistance to the teacher. Lesson plans are designed and developed for the following reasons:
 - a. Organizes and coordinates content and instruction.
 - b. Presents a logical sequence to instruction.
 - c. Provides a listing of instructional materials and aids.
 - d. Provides a basis for program planning and evaluation.
 - e. Causes teachers to analyze and plan content prior to instruction.
 - f. Provides a record of actual course content and emphasis.

A sample lesson plan for an industrial arts program is provided on pages 74-75.

2. Instructional Systems. When individualized learning techniques and materials are used in a vocational program, an instructional systems approach to management is helpful. The instructional system provides an organized and coordinated procedure for combining course content and instruction and tailoring these to fit the student's individual needs. The major emphasis of the instructional systems approach is to ensure that the student receives the appropriate content and assistance in the program. Instructional systems provide for pretesting, varied learning strategies, feedback, immediate evaluation, and recycling if required. A sample system for a welding program is included on pages 76-78. The sample was developed as a student guide for program orientation.
3. Learning Contracts. The learning contract is a management tool which allows the teacher and student to contract and agree on which competencies are to be learned in the course. The instructor evaluates the needs of the student and discusses these with the student. Then, a learning contract is developed which includes the competencies and requirements for the course. The contract provides a method for organizing the content and instruction on an individualized basis. Cooperative and employment-based experience programs use a training agreement. Sample learning contracts are shown on pages 79-85.
4. Training Plans. A method for a teacher-coordinator to plan, organize, and integrate classroom instruction with on-the-job training. Training plans include those tasks or competencies required on the job. The plan is expanded, adjusted, and revised in accordance with the needs of the individual student and supervising employer. Training plans can be designed for three-to six-week segments of job training. A training plan is shown on page 86.

Lesson plans, instructional systems, learning contracts, and training plans are examples of how teachers organize and manage a competency-based vocational program. The overall purpose of a management system is the integration of instructional content, learning, evaluation, and documentation of achievement. The management system assists the teacher in providing for an effective and efficient vocational program.

SELECTING INSTRUCTIONAL MATERIALS

It has been emphasized that CBE does not require the use of any single method of instruction or a particular type of instructional material. However, it is important that materials selected do contain

learning activities, resources, and evaluation techniques that are compatible with the course content (competencies) identified for the vocational program. Therefore, instructional materials must be selected carefully for programs if the goals and objectives are to be realized.

What are the factors or questions to be considered when selecting instructional materials for CBE? Depending on the type of instructional material, the following questions need to be considered:

1. Does the content (competencies) included in the materials correspond to the competencies for the course?
2. Are the criterion/standards used for evaluating student performance the same as identified for the course competencies?
3. Can the materials be integrated into the current instructional system?
4. If the materials are in an audio-visual format, is the present audio-visual projectional equipment adequate?
5. How dated are the materials? Are current terminology, procedures methods, etc. included in the materials?
6. Can the material be duplicated to save money?
7. Does the format of the material lend itself to the type of student being served?
8. If the materials still are under development, such as a series of modules or films, what assurance is there that the publisher or developer will complete the series?
9. Will the current budget be adequate to purchase the complete package of materials?

These are a few of the questions which should be considered in selecting appropriate instructional materials for a competency-based program. If the materials do not support and facilitate the teaching-learning process, then the course may lose its competency-based characteristic. Therefore, it is important to fit the instructional materials to the course content, rather than trying to design the course around the

materials. An excellent resource material checklist has been developed by the State Distributive Education Service for evaluating instructional materials for competency-based programs. The checklist is included on pages 87-88.

SUMMARY

The development and implementation of CBE in Virginia does not require teachers to change instructional methods currently being used in the vocational program. The major emphasis of CBE is to ensure that the content is role-relevant and, therefore, enables students to be more successful in subsequent education and eventual employment.

Because CBE does include several unique characteristics--using performance objectives, informing students of content prior to learning, applying criterion-referenced testing, and documenting of competencies--a management system may be required. Lesson plans, instructional systems, training plans, and course contracts are a few of the more successful management systems used in CBE.

Finally, when selecting or developing instructional materials for a competency-based vocational program, the major concern is not what type of material is used but how well the selected content relates to the competencies for the program. There are many systems, materials, and resources which have been developed; but unfortunately not all meet the needs of the student, teacher, and employer.

CBE STANDARD II CHECKLIST

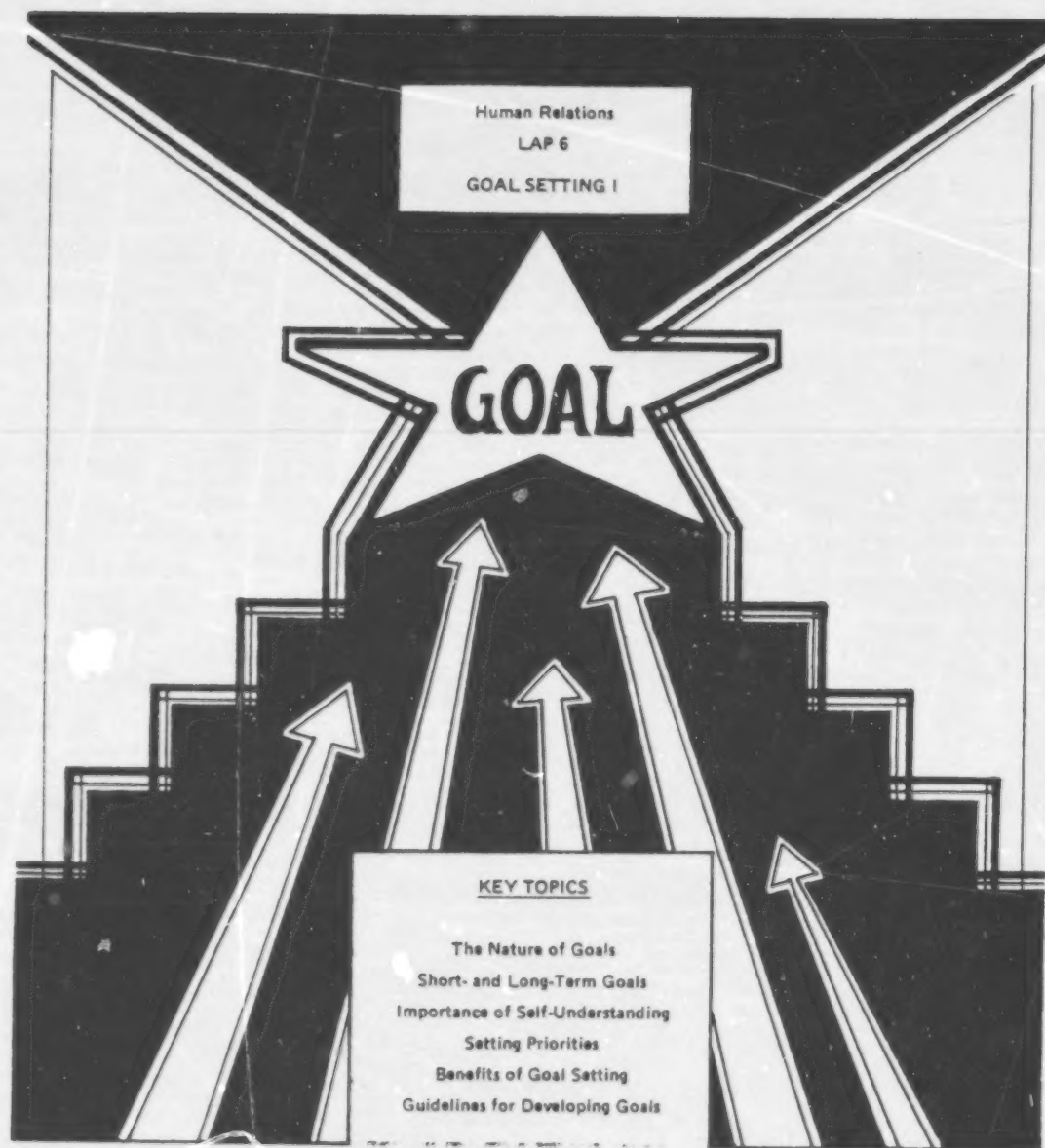
The purpose of this checklist is to assist the teacher or administrator in determining if a vocational program complies with the requirements and criteria of CBE Standard II: "Competencies are specified to students prior to instruction."

- A. There is a procedure for providing task/competency information to students prior to instruction.
- B. The information is specific and concise.
- C. Information is provided prior to instruction in a program, course, or unit of instruction.
- D. The information is based on performance objectives, competency profiles, checklists, training plans, or contracts.
- E. Each student is provided with specific competency information.

YES	NO	?

EVALUATION: A vocational program complies with CBE Standard II when all items are checked YES.

SAMPLE MATERIALS



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Objectives

- A Define the term "goal."
- B Identify the major types or categories of goals.
- C Explain the importance of self-understanding in the identification of appropriate goals.
- D Describe the benefits to be derived from setting goals.
- E Describe specific guidelines to follow when developing goals.

INDIVIDUAL LEARNING ACTIVITIES FOR OBJECTIVES A, B, C, D, and E

- A,B For an introduction to the concept of "goals" and a description of the major types of goals, read the information sheet on pages 7 - 9 called "The Nature of Goals."

As you read the material, seek answers to the following questions:

1. Are you in control of your life, or is your life in control of you?
2. What is a "goal"?
3. What is the difference between a "want" and a "goal"?
4. What is the purpose of goals?
5. Should you consider setting goals in all areas of your life?
6. What is the difference between a "long-term" and a "short-term" goal?

When you have finished reading, refer to the exercise on page 10 called "Analyzing Goals." Complete the activity, following the directions provided on that page. You can check your responses with the answer guide on page 18.

- C To help you understand the importance of self-understanding in goal setting, read the information sheet on pages 11 - 13 called "It's Up To You!"

When you have finished reading, try to answer the following questions.

1. Who establishes your goals?
2. Where do the motives for your behavior come from?
3. Why are personal "priorities" necessary?

If you have difficulty with any of these questions, reread "It's Up To You!"

(Continued)

COMPETENCY ACTIVITY I
EDVT 4980

UNIT: Overview of Competency-Based Education: What's Required

COMPETENCY: DEMONSTRATE A BASIC KNOWLEDGE OF COMPETENCY-BASED EDUCATION

PERFORMANCE OBJECTIVE:

Provided with a review of CBE principles, standards, and characteristics, demonstrate your knowledge of CBE by correctly evaluating the CBE implementation status of a vocational program/course. The evaluation results must conform with the State CBE Standards and be consistent with CBE principles/characteristics.

LEARNING ACTIVITIES:

Directions: Read each learning activity carefully before completing the activity. Be sure to complete each activity in sequence and check (✓) as you complete.

- _____ 1. Carefully study the Course of Study, LEARNING CONTRACT and COMPETENCY RECORDING FORM for this course.
- _____ 2. Read the performance objective for this competency and the enabling objectives in your Course of Study (EO #1-5). If you feel that you can successfully demonstrate the competency, see the instructor before proceeding into the next activity.
- _____ 3. Read and study the Introduction and Section I, pages 1-22 in your text: Guide for Implementing Competency-Based Education in Vocational Programs.
- _____ 4. Study and complete the CBE IMPLEMENTATION CHECKLIST on page 23 in your text.
- _____ 5. GROUP ACTIVITY Meeting Date _____
Attend and participate in the discussion on CBE implementation provided by your instructor. Be prepared to discuss State CBE Standards and requirements for implementing CBE at the local level.
- _____ 6. INDIVIDUAL ACTIVITY
 - a. Identify the program and course(s) in which you plan to develop and implement CBE. Be sure to identify VERS codes for the course(s) in the program you plan to develop on a CBE format.

Course Learning Contract Due: _____

EVALUATION:

Your grade for this competency will be based on the accurate evaluation of the CBE implementation status of a vocational program/course. The evaluation results must be consistent with CBE state standards and basic philosophy. If you have any questions concerning evaluation procedures, see your instructor.

CRITERION-REFERENCED MEASURE:

Demonstrate a basic knowledge of CBE by correctly evaluating the CBE implementation status of your vocational program/course(s).

JOB SHEET
COSMETOLOGY I

COMPETENCY: 3.1 Apply virgin bleach

DIRECTIONS: Obtain the supplies and materials listed, then follow the procedure provided. Upon completion of the competency, see your instructor for evaluation criteria.

Implements and Supplies

Towels	Bleach preparation
Dye Cape	Cotton
Shampoo	Cream Rinse
Glass or plastic bowls	Clips, Combs
Peroxide	Record Card
Measuring glass	Talcum Powder
Bleach Applicator	Rubber Gloves

Procedures

1. Prepare patron.
2. Shampoo hair if necessary.
3. Dry hair.
4. Comb and part in four sections.
5. Mix bleach.
6. Protect hands with rubber gloves.
7. Apply bleach
 - a. Apply the bleach 1/4 inch strands, starting about 1 inch from the scalp and 1 to 2 inches from the hair ends. APPLY FIRST TO THE TOP AND THEN TO THE BOTTOM OF EACH STRAND.
 - b. Continue with second, third, and fourth sections in the same manner.
8. Test for color.
9. Apply bleach to scalp area and hair ends. This is done when hair has lightened sufficiently.
10. After the desired shade has developed, rinse, give a mild shampoo with warm water, and then dry.
11. Give a cream rinse and set in desired style.
12. Make out complete record card.
13. Clean shampoo bowl, sterilize tools, and put station in order.
14. Check with instructor when finished.

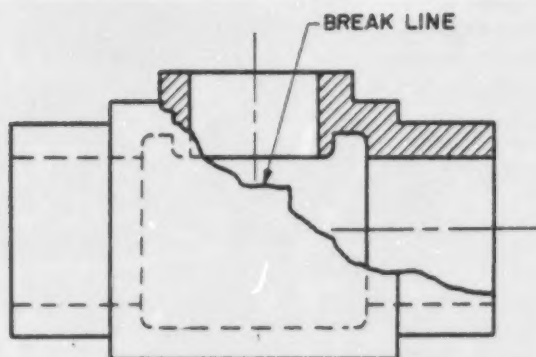
SAMPLE LINEAR PROGRAM

94. The next type of sectional view is called a "broken-out section" and is used when the draftsman wants to show interior details without having to draw a full or half section. See Figure 14.

93. full (half)
half (full)

A BROKEN-OUT SECTION

FIG. 14



95. A _____-out section is drawn on the existing view and therefore does not require a separate view.

94. no response

96. The portion that is broken-out is separated from the exterior portion by a "break line." See Figure 14.

95. broken

97. The draftsman uses a _____ line to separate exterior and interior surfaces on the _____-out section.

96. no response

TEACHER'S DAILY LESSON PLAN

by

POLLY DARTON

Measurements

Lesson Title

General Industrial Arts I
Course

Technical Sketching & Design
Instructional Unit

TASK/COMPETENCY: (knowledge, skills or attitudes student gains from instruction) Develop skill in measuring using both the (SI) metric and the English Systems.	
PERFORMANCE OBJECTIVES: (expected conditions, performance and criteria) 1. Given a paper and pencil, define the following metric terms including metre, decimetre, centimetre, and millimetre with 100% accuracy. 2. Given a metric scale, measure lines to the nearest metre, decimetre, and centimetre.	
EQUIPMENT/SUPPLIES 1. Metre sticks 2. Yard sticks	AUDIO VISUALS: 1. Transparencies on using the SI metric system. 2. Handouts on measuring.
REFERENCES: 1. Feirer's article on metrics. (SI) Metric Handbook by John L. Feirer Published by Charles A. Bennett 2. Virginia Competency Catalog <u>General Industrial Arts</u> Task #1	
STUDENT ASSIGNMENT: 1. Complete homework assignment on measuring lines using both metric and Customary system. 2. Measure the following objects using both systems: Height of door knobs and tables; Width of doors, and student's height.	

PRESENTATION: (Introduction, presentation, discussion, application, & evaluation)

1. Discuss the SI metric system.
2. Discuss and show the various SI metric measuring instruments.
3. Review terms of the metric system.
4. Discuss the divisions of a SI metric scale.
5. Practice class measurements on SI metric scales using class handouts.

CRITERION REFERENCED MEASURES:

Match the following terms with their best meaning in the space provided.

- | | |
|-------------------|--|
| ___ 1. metre | a. one hundredth of a metre |
| ___ 2. decimetre | b. one tenth of a metre |
| ___ 3. centimetre | c. the fundamental unit of length in the metric system |
| ___ 4. millimetre | d. one thousandth of a metre |

WELDING I INSTRUCTIONAL SYSTEM
STUDENT INFORMATION GUIDE

The instructional materials in this course have been designed to assist you in learning the basic manipulative skills and technical knowledge of welding. Only competencies and skills needed by the welder are included in this course of study. Therefore, only relevant and necessary skills and knowledge will be covered in the instructional materials.

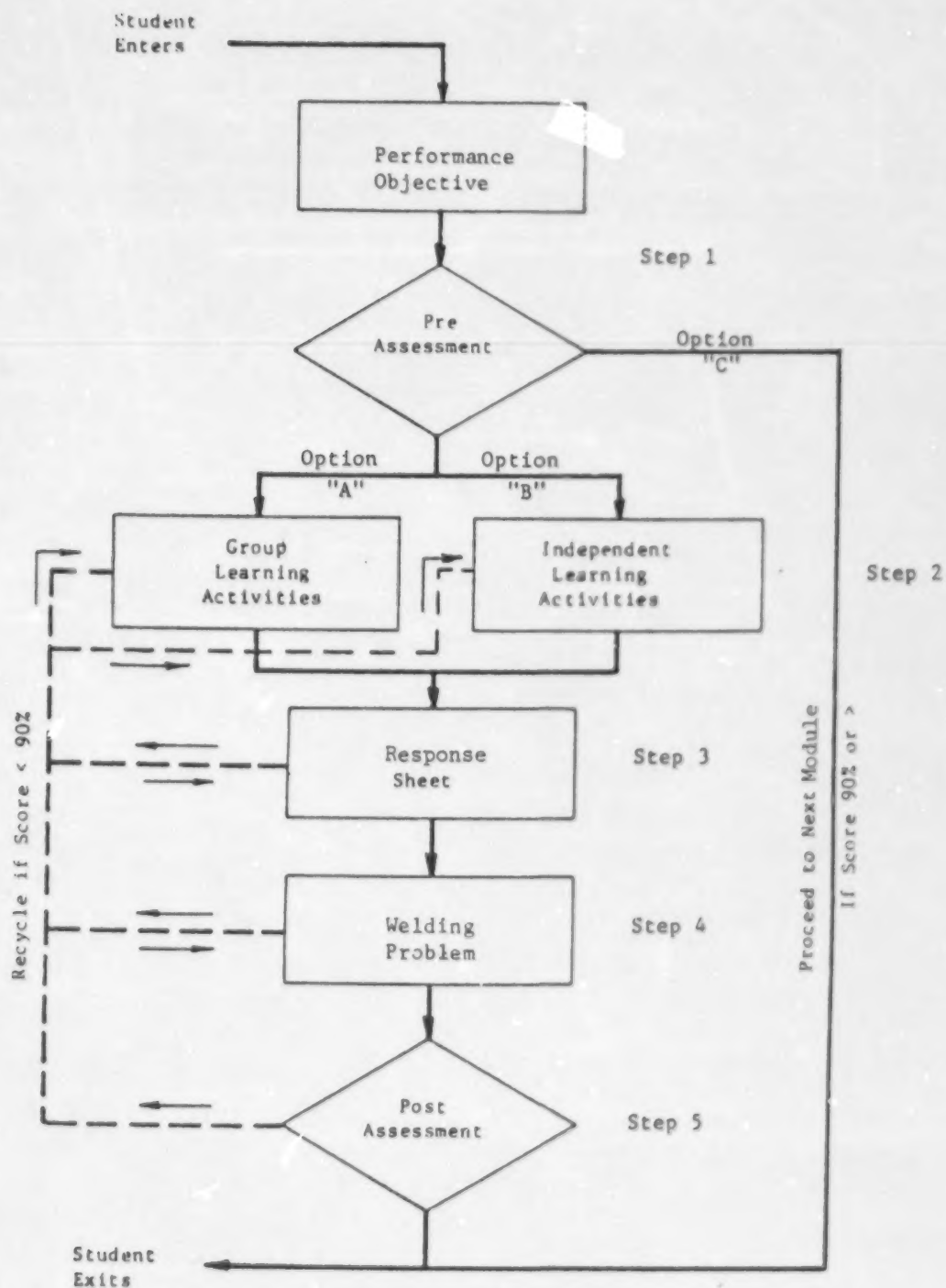
The instructional materials have been divided into short blocks or units covering one or two competencies. These units of information are called "Modules" which contain all information and direction in order to learn a required competency or skill. In each welding course there are usually eight to ten modules.

As a student, you have three learning options or choices in completing a particular module. The first, "Group Meeting Option," is basically the scheduled lecture-lab sequence in which you meet with other students on a weekly basis. Shown below are the learning sequence steps for this option. In order for you to learn the content or competencies of a particular module you must follow each step carefully. Refer to Figure 1 on the next page.

- STEP 1 First, carefully read the directions, introduction, performance objectives and enabling objectives contained in the module. If after reading them you feel that you can successfully do what has been stated, see your instructor and ask to take the "Pre Assessment" test. If you score 90% or greater, you can then proceed to the next module; if not, proceed to Step 2.
- STEP 2 This step consists of a number of learning activities such as reading assignments, information sheets and optional audio visual presentations. You will need this information in order to complete the "Response Sheet," "Project Sheet," and "Post Assessment" test in the module.
- STEP 3 After completing steps 1 and 2 you are now ready to complete the "Response Sheet." The purpose of this activity is to assess your knowledge and skills stated in performance and enabling objectives. When you complete the "Response Sheet," have it scored by your instructor. You must score 90% or better to proceed to the next step; if not, review steps 1 and 2 until you can successfully complete the "Response Sheet."
- STEP 4 Next, read the directions for the welding project and obtain the materials needed. Complete the "Project Sheet" and have it scored by your instructor. If you score less than 90%, review steps 2 and 3; if not, proceed to the next step.
- STEP 5 The final activity required in order to complete the module is successful completion of the "Post Assessment" test. If you score 90% or greater, you may proceed to the next module; if not, you must review steps 2 - 4 until you can successfully pass this test with a score of 90%.

Figure 1

The Instructional System and Sequence
Used in the Modules



The second option you have is the "Independent Study Option" in which you may elect not to attend the regular scheduled class meeting and therefore study independently the materials in the modules. With the exception of attending a discussion group meeting and working during regular class hours you complete the same learning sequence as outlined above.

Finally, there is available the "Post-test Option" that requires you to take a practical exam (welding problem) and post assessment test concerning the materials in the module. This option is provided for in step 1 of the learning sequence described above. Upon successful completion of the practical and written tests you may proceed to the next module.

A student may elect any of the three learning system options with the approval of his instructor. All options require the same proficiency level of 90% to satisfactorily complete a learning activity or module. You may also elect another instructional system option if you are unsuccessful in the option you choose.

If after reading this section on using modular materials, you have any questions, see your instructor.

LEARNING CONTRACT
FOR
DRAFTING II

I, _____, agree to learn the appropriate competencies during a six-week grading period of _____.
(name of course) The projects and materials developed in the course must comply with the criteria/standard for each competency listed.

DUTY AREA: _____ Date Completed _____

COMPETENCIES/PROJECTS:

I further agree that in order to learn the competencies in the duty area listed above, that I must complete any and all drawings, projects, and objectives assigned by the instructor.

I further agree that if satisfactory completion is made of all the above listed competencies I will receive a final grade of _____ for this grading period.
(grade)

STUDENT

DATE

INSTRUCTOR

DATE

LAB CONTRACT
AND
COMPETENCY LIST
FOR

STUDENT

FRAMUS
TECHNICIAN
PROGRAM



ZED COUNTY VOCATIONAL CENTER
C.B. SHARP - INSTRUCTOR

This fictional student lab contract was developed by Curtis Finch at Virginia Tech. It is designed to assist vocational teachers in developing materials which satisfy some of the requirements and criteria associated with Virginia CBE standards. Appreciation is extended to George Lear, Virginia Tech, for use of the lab contract concept and to Tom Vantreese, Vocational Education Curriculum Development Center, University of Kentucky, for the cover design (March 1981).

A Message to the Employer:

This document is designed to provide you with relevant information about a prospective employee. It contains details about competencies achieved by this student in a formal framus technician program. Please note that standards associated with framus technician competencies are provided on page 2. The competencies and instructor ratings are detailed on pages 4 to 7. We at Zed Vocational Technical Center believe this information will communicate to you specific areas of student competence and help you decide where this graduate will fit into your organization. Please feel free to contact C.B. Sharp if you need any further information or clarification.

A Message to the Community College/Technical Institute Student Personnel Officer:

This contract and competency list serves to communicate student mastery of basic competencies associated with the framus technician occupation. It includes several items which may be used as part of your advance placement program. Among these are standards associated with framus technician competencies (page 2) as well as competencies and instructor ratings (pages 4 to 7). We at Zed Vocational Technical Center believe this information will be helpful to your instructors when they determine the extent of advance placement/credit for this framus technician graduate. Please feel free to contact C.B. Sharp if you need any further information or clarification.

A Message to the Student:

This is your framus technician program contract. It will be used throughout this program and may be provided to prospective employers and community college/technical institute student personnel officers when you are seeking employment or advanced placement in educational programs.

Bring the contract to class each day so your instructor can sign off on those competencies you have mastered. Keep the contract clean and neat and be sure not to lose it. This is your record of achievement in the framus technician program and it will be most valuable when you are looking for a job in the framus technician field or are planning to pursue additional studies in this area.

R.U. Ready

R.U. Ready, Principal
Zed County Vocational Technical Center

P.S. When the competency rating sheets (pages 4-7) are embossed with the official school seal, they become official school records.

Evaluation Procedures for the Framus Technician Program

You will be evaluated by your instructor on your ability to be a competent framus technician. When you feel you are ready to perform a competency, your instructor will evaluate you using a check list (criterion referenced measure) which includes standards for the competency.

One of these check lists may be found on page 8. Other check lists will be provided by the instructor as you begin to work on competencies. After evaluating your competence, the instructor will assign one of the six ratings listed below. If, for example, you get a "1" and then at a later date show competence at a higher level, the instructor will initial the block at that level too. Keep in mind that you can progress in school and in employment if you learn the right competencies for this occupation.

- 6 - Can perform this competency without supervision or assistance above industry standard and can lead others in performing it.
- 5 - Can perform this competency without supervision or assistance at or above industry standard.
- 4 - Can perform this competency without supervision or assistance at the job entry/advanced learner level.
- 3 - Can perform this competency satisfactorily but requires periodic supervision or assistance.
- 2 - Can perform some parts of competency satisfactorily but requires instruction and supervision to perform the entire competency.
- 1 - Has some knowledge and limited experience but not sufficient for participation in a work environment.

Contract

I understand the above ratings and evaluation procedures, I agree to follow posted lab rules, and will do my best to become a competent framus technician.

Student _____ Date _____

Your Employment Goals

Essential Competencies for Employment as a Framus Technician Helper (entry level):

- 1.1. Perform 3000 hour inspection*
- 2.1. Replace fruse*
- 2.2. Replace fram belt*
- 2.3. Replace fralterator*
- 3.1. Demonstrate punctuality**
- 3.2. Demonstrate dependability**
- 3.3. Follow safety regulations**
- 3.4. Be neat and clean in appearance**
- 3.5. Get along with others***
- 4.1. Use inspection scope*
- 4.2. Use fruse crimper*

Essential Competencies for Employment as a Framus Technician Trainee (entry level):

The above plus

- 1.2. Perform non-destructive inspection*
- 1.3. Perform intermediate inspection*
- 2.4. Repair fralterator*
- 4.3. Use X-ray analysis modulator*
- 4.4. Use comutator resurfacers*

Essential Competencies for Employment as a Framus Technician (entry level):

The above plus

- 1.4. Supervise others performing inspection*
- 1.5. Develop inspection schedules for employees*
- 2.5. Troubleshoot charging system*
- 4.5. Use charging system probe*

*Selected from the T-VECS catalog, Framus Technician, with assistance of the Framus Technician Advisory Committee.

**Selected from 27 occupational survival skills (University of Illinois Study) with assistance of the Framus Technician Advisory Committee.

***Identified through a critical incident study conducted locally in 1981.

4. Tool and Equipment Competencies

4.1. Use inspection scope

Rating	1	2	3	4	5	6
Instructor Initials						
Date						

4.2. Use fruse crimper

Rating	1	2	3	4	5	6
Instructor Initials						
Date						

4.3. Use X-ray analysis modulator

Rating	1	2	3	4	5	6
Instructor Initials						
Date						

4.4. Use comutator resurfacers

Rating	1	2	3	4	5	6
Instructor Initials						
Date						

4.5. Use charging system probe

Rating	1	2	3	4	5	6
Instructor Initials						
Date						

Instructor Rating

6

Can perform this competency without supervision or assistance above industry standard and can lead others in performing it

5

Can perform this competency without supervision or assistance at or above industry standard

4

Can perform this competency without supervision or assistance at the job entry/advanced learner level

3

Can perform this competency satisfactorily but requires periodic assistance and/or supervision

2

Can perform some parts of competency satisfactorily but requires instruction and supervision to perform the entire competency

1

Has some knowledge and limited experience but not sufficient for participation in a work environment

Check list/Criterion Referenced MeasureCompetency: 2.1. Replace fuse

Assignment: Replace a framus fuse. You may use a basic tool kit, fuse crimper, manufacturer's manual, and any notes taken during your instruction. Your instructor will provide the framus and replacement fuse. No assistance from others may be provided.

While Completing the Assignment:

	Yes	No
1. Safe work practices were followed.	☐	☐
2. Time and materials were managed effectively.	☐	☐
3. Equipment and tools were used properly	☐	☐
4. Replacement procedures specified in manufacturer's manual were followed	☐	☐

The Completed Assignment:

1. Met or exceeded manufacturer's specifications.	☐	☐
2. Was finished in time equal to or less than time specified in the flat rate manual.	☐	☐
3. Was neat and clean	☐	☐

All items on the list should be checked "yes. If any are checked "no", work with your instructor to improve your competence in these areas. Then try the assignment again to see if you have mastered the competency.

COE INDIVIDUALIZED TRAINING PLAN

Employer
Copy: Student
Coordinator

Name _____ Job Title _____

Firm _____ Training Supervisor _____

Rating Scale: 1 - Outstanding 2 - Meets Expectations 3 - Needs Improvement 4 - Unsatisfactory

Experiences and Training Needed	On Job	Evaluation for Grade Period				Comments
		1	2	3	4	
<u>Typewriting:</u> Types accurate and properly formatted letters, reports, forms, statistical material, and memorandums from rough draft and corrected copy. Types envelopes, cards, and labels. Types stencils, masters, or "camera ready" copy. Produces neat corrections. Proofreads, corrects, and evaluates quality of all work. Composes and types answers to routine letters.						
<u>Word Processing:</u> Transcribes business letters in nailable form from recorded media. Demonstrates proper techniques of operating text-editing equipment. Edits and revises business correspondence, forms, and reports.						
<u>Shorthand and Transcription:</u> Takes dictation. Produces nailable transcripts.						

CRITERIA FOR EVALUATING RESOURCE MATERIALS FOR COMPETENCY-BASED PROGRAMS

Name _____

Type of Material _____
(manual, filmstrip, tape, etc.)

Publisher _____

(yes/no response)

I. INSTRUCTIONAL RELEVANCE

1. Is the resource material based on the key and/or enabling objectives as identified by the vocational program service? (1) _____

II. APPROPRIATENESS

2. Is the level of difficulty appropriate for the specified student employment? (2) _____
3. Is the material appropriate for use by the intended students in terms of reading level (if applicable), skill levels and special student characteristics (handicapped, disadvantaged, gifted and talented, ethnic minorities, and absence of sex bias?) (3) _____

III. PERFORMANCE OBJECTIVES

4. Are student performance objectives stated at the appropriate places throughout the material? (4) _____
5. Are performance objectives consistent with the program goals and objectives. (5) _____
6. Are prerequisites clearly identified/stated? (6) _____
7. Are knowledge and skill objectives of instruction sequenced from simple to complex performance? (7) _____
8. Does each terminal performance objective contain a statement of expected behavior or the product of behavior? (8) _____
9. Does each terminal performance objective contain the conditions under which it is to be performed? (9) _____
10. Does each terminal performance objective describe the standard(s) or criterion (criteria) for acceptable practice or demonstration of performance? (10) _____

IV. LEARNING ACTIVITIES (Cont'd)

11. Do the learning activities allow the students to practice the required performance? (11) _____
12. Do the learning activities provide the opportunity for achievement of the required objectives at a prescribed level of performance? (12) _____

V. EVALUATION MEASURES

13. Do assessment items reflect the behavior specified in the program objective? (13) _____
14. Is performance or product of performance the source of evidence of student achievement? (14) _____
15. Are the evaluation measures criterion-referenced? (15) _____

VI. INSTRUCTIONAL MANAGEMENT

16. Is teacher's manual or guide provided for use with the materials? (16) _____
17. Does the teacher's manual or guide provide for several approaches to utilization of the material? (17) _____
18. Does the teacher's manual/guide report the results of field tests to determine that the resource materials will lead students to the achievement of stated objectives? (18) _____
19. Is the rationale/utilization of the resources clearly described? (19) _____

SECTION IV

"Criterion-referenced measures are used to measure achievement of competencies."

In this section, the following CBE implementation step is presented:

8	DEVELOP CRITERION-REFERENCED MATERIALS
---	--

Evaluation serves several important functions in competency-based vocational programs, for example, diagnosis of learning effectiveness and determination of competency achievement for documentation. The diagnosis of learning effectiveness is necessary to adjust the instructional program to meet the student's learning needs. Evaluation serves also to identify those students who have reached a satisfactory level of competency so that their performance can be documented on the competency recording form. Both of these two major functions of evaluation are necessary and important to the vocational teacher and student. Without effective evaluation it is difficult for the teacher to determine whether students are gaining the required competencies for success in subsequent course work and for employment after completing the program.

In competency-based vocational programs in Virginia, evaluation must be criterion-referenced:

CRITERION-REFERENCED MEASURES ARE USED TO
MEASURE ACHIEVEMENT OF COMPETENCIES.

This means that a student's performance is measured and evaluated by a predetermined criteria or standard which normally requires a performance level equal to job entry or success in the program.

This third CBE standard requires (1) a criterion-referenced measure for each validated task and (2) a criterion-based testing and evaluation procedure to test the performance objective. Therefore, there must be a test item, test, or a statement on how the testing/evaluation will be conducted for each competency identified in the program. In addition, these test items, test, or statements must compare student performance to the predetermined criterion-standard in the

performance objective, rather than to other students' performances or accomplishments.

These requirements concerning evaluation in competency-based education apply only to the terminal competencies established for the vocational program/course. Therefore, criterion-referenced testing is not required for the enabling skills, knowledge, and attitudes included in the program.

It should be mentioned that criterion-referenced testing does not preclude the need for norm-referenced testing when required. If it is necessary to compare students with each other or to a norm, then norm-referenced procedures should be used. Selecting students for competitions, selecting students' work for parent's night, or evaluating student performance on a national vocational competency exam are example situations when norm-referenced evaluation is appropriate.

Therefore, the purpose of this section is to discuss the use and the development of criterion-referenced testing in competency-based vocational programs.

MEASURING LEARNING

It has been established that criterion-referenced evaluation is both useful and required for competency-based vocational programs. Specifically, the following evaluation components are required for CBE: (1) there must be measurable, observable criterion/standard for the task/competency, (2) a criterion-referenced measure must exist for each task/competency, and (3) the testing must compare student performance to a predetermined criterion/standard to be criterion-ref-

ferenced. Therefore, a teacher evaluates student performance by criterion-referenced testing procedures in competency-based programs.

Before proceeding with a discussion of evaluation methods and techniques, the following terms need to be defined:

CRITERION (Criteria). The standard that a student must meet to reach mastery of an objective.

CRITERION-REFERENCED MEASURE (CRM). A test, test item, or statement which describes how a student will be tested and/or evaluated, the CRM is based on the task/competency standard or criterion. Criterion-referenced measures may include the standard or criterion as illustrated in the following examples:

Examples: Psychomotor

Tune an unadjusted carburetor in accordance with the manufacturer's specification within 45 minutes.

Cognitive

Identify 9 out of 10 technical terms used in masonry on a written test.

Affective

Exhibit positive attitudes in the vocational classroom and laboratory. Your attitudes will be evaluated by the "Program Attitude Checklist."

CRITERION-REFERENCED TESTING. A process of testing which yields measurements that are directly interpretable in terms of specified performance standards. An individual performance is compared to a criterion, the criterion being the work or performance standard. Therefore, criterion-referenced testing is based on absolute standards such as job competency rather than relative standards such as class standing. (Also called criterion-referenced evaluation, objective-referenced testing, proficiency testing, or a domain-referenced testing.)

STANDARD. That part of a performance objective or of a criterion-referenced measure which describes how well or to what proficiency level a task must be performed. (Also called performance level, criterion, or work standard.)

Methods of Measurement

There are a number of methods for measuring learning in CBE. The

method selected really depends on whether the task/competency is a skill (psychomotor domain), knowledge (cognitive domain), or attitude (affective domain). The task/competency domain not only will determine the evaluation method, but also the type of testing instrument to be used.

Testing Skills (Psychomotor Domain)

When evaluating student performance for competencies requiring skills: TYPE A BUSINESS LETTER, TUNE A 4-BARREL CARBURETOR, PREPARE A SALAD, or DRAW AN ORTHOGRAPHIC VIEW, a performance test is required. There are several testing instruments used when performance testing is appropriate:

1. Checklist. A checklist is used to evaluate a process or procedure that is important when performing a task/competency. The checklist usually has a listing of the steps or procedures which a student must follow for satisfactory performance. The rating on the checklist is a YES or NO, ADEQUATE or INADEQUATE, ACCEPTABLE or UNACCEPTABLE, or some form of either/or terminology. A sample checklist is shown on page 109.
2. Rating Scale. A rating scale is appropriate when the quality of a performance is important. For example, if a student bakes a cake as required by a task/competency, the quality of the cake (taste, appearance, etc.) may be more important than the procedure. Sample rating scales are included on pages 110-111.
3. Project. For many vocational courses the project is an excellent means of measuring skill, knowledge, and process. Both rating scales and checklists may be used, however, comparing the project to a model or sample product also is appropriate. The advantage in using projects is that several tasks/competencies can be evaluated in one project. If several competencies are tested by a single project, it is important that the criterion/standard for each competency be applied in evaluating the completed work. A sample evaluation instrument is provided on pages 112-115.

Testing Knowledge (Cognitive Domain)

The evaluation of a student's knowledge is very important in a vocational program because nearly every skill task/competency requires a de-

degree of technical knowledge. A knowledge test will be required for competencies dealing with technical knowledge skills: IDENTIFY BASIC ACCOUNTING TERMS, LIST THE SAFETY RULES FOR A TABLE SAW, CALCULATE PROFIT MARGIN, etc. Therefore, the following test instruments are used when assessing knowledge skills:

1. True/False. Used primarily for testing the truth or correctness of an answer. The true/false test is relatively easy to score. The major problem with this form of testing is that it may encourage guessing.
2. Multiple Choice. Useful in measuring the recall of students to basic knowledge, principles, and concepts. The multiple choice is more difficult to construct than the true/false test. A sample test instrument is provided on pages 116-117.
3. Essay/Short Answer. An excellent test of basic concepts, principles, and relationships which require the student to organize and synthesize knowledge. Does require basic writing skills of the student.
4. Oral. When periodic checks are required to determine retention of knowledge or the understanding of basic principles and concepts, the oral exam is helpful. Oral exams allow the teacher to structure questions from the responses given by the student. The oral exam requires the use of speaking skills by the student.
5. Matching. Requires the learner to identify matching or related items on the test. Matching tests are excellent for association of technical terms and similar information.
6. Completion. Useful in testing basic information, principles, and terms by requiring the student to recall the correct answer.

Testing Attitudes, Feelings, and Values (Affective domain)

Many educators often say that student attitudes, feelings, and values are difficult to measure or determine. Perhaps there is some truth to this concern. However, teachers do determine, sometimes subjectively, what students' attitudes, feelings, or values are concerning a wide range of issues. It is probably easier to measure attitudes, feelings, and values

than to teach them. Vocational educators have recognized the need for including competencies in the affective domain, and employers have indicated that these competencies are important for success.

Assuming that values and positive attitudes are being taught, then how does a teacher measure achievement in the affective domain? There are several testing procedures which will yield measurable results:

1. Observation. Much of a teacher's information concerning a student's attitudes, feelings, and values come from observation. By watching how a student works with others, handles shop equipment, and responds to direction from the teacher, an assessment of the student can be made. Using a checklist of positive attitudes or behavior will assist the teacher in reaching a conclusion concerning the student's achievement in the affective domain. Checklists may be used in cooperative programs to evaluate students at their job site by the sponsoring employer. A sample checklist is provided on page 118.
2. Interview. Another means of determining student attitudes and values is simply by asking "What do you think concerning...?" The responses to a structured interview will help the teacher in assessing what a student values or thinks concerning a topic.
3. Questionnaire/Inventory. Perhaps the most popular form of testing or assessing student attitudes and values is the questionnaire or inventory. Standardized placement tests which measure a student's interest in various occupations use this technique. These tests are difficult to structure and require some expertise in psychological testing. A sample survey is provided on pages 119-120.

Because students are individuals and learning styles vary, some thought must be given to selecting the right testing format for the individual or group. It is suggested that teachers use a variety of evaluation instruments to measure achievement. If a student has difficulty passing the test, it could mean that the test form is inappropriate rather than a lack of skill or knowledge on the student's part.

Finally, in competency-based education the important factor is not the type of test, but whether the testing method is appropriate for the

learning domain required by the competency. Therefore, if the competency involves a skill, then a performance test is required. The relationship between learning domain and testing method is illustrated Figure 3, page 98.

DEVELOPING CRITERION-REFERENCED MEASURES

At the heart of competency-based evaluation is the criterion-referenced measure (CRM). A criterion-referenced measure is a test item, test, or statement on how testing will be conducted. The purpose of the CRM is to test the performance objective and thus determine whether the student has met the required performance level (criterion/standard). It helps to think of the CRM as a means of testing what has been planned in the performance objective. In other words, the performance objective is a plan for instruction with set conditions and standards, while the CRM is a vehicle for measuring the outcomes of the learning. Therefore, if a test item or test (measure) is based (referenced) on a standard (criterion) then it is a criterion-referenced measure, thus the term.

Criterion-referenced measures serve important functions in a competency-based vocational program, among these are the following:

1. Assists the teacher in planning and ensuring that the testing of a competency is based on the performance objective.
2. Ensures that all competencies will be evaluated, using the predetermined standard for each competency.
3. Integrates instruction and learning with testing and evaluation since both phases are based on a performance objective.
4. Ensures an accountability of the testing program, because the CRM is based on the performance objective and instruction.
5. Assists the student in better understanding what is required for successful performance.

Figure 3

The Relationship Between Learning Domain and Testing Method

SKILLS (PSYCHOMOTOR DOMAIN)	
Method	Test Instrument
Performance Testing	1. Checklist 2. Rating Scale 3. Project
KNOWLEDGE (COGNITIVE DOMAIN)	
Method	Test Instrument
Knowledge Testing	1. True/False 2. Multiple Choice 3. Essay/Short Answer 4. Oral 5. Matching 6. Completion
ATTITUDES (AFFECTIVE DOMAIN)	
Method	Test Instrument
Responsive Testing	1. Observation 2. Interview 3. Questionnaire/Inventory

6. Communicates to the employer and advisory committee the evaluation procedures and standards.
7. Improves the organization and quality of the evaluation program.
8. Ensures that the total task/competency is measured, rather than just a portion, such as knowledge.
9. Yields constant results because a constant standard is used.
10. Reduces student test anxiety because evaluation is based on what the student has been previously informed about.

Guidelines for Writing CRM's

When writing or selecting criterion-referenced measures for a vocational program or course, certain guidelines should be followed.

1. The criterion-referenced measure must require the same performance on the test as is stated in the performance objective. Consider the following example:

Performance Objective

Provided with a machine part, specifications, drafting tools, materials, and equipment, draw a two-view detail. The detail drawing must include no more than two views, be orthographically correct, and comply with ANSI drawing standards.

Criterion-Referenced Measure

Describe how to prepare a two-view detail drawing, according to ANSI drawing standards.

In the example, the performance objective required one type of performance (skill) and the CRM a different type (knowledge). Therefore the CRM is not acceptable. The CRM should read:

Draw a two-view detail drawing of a machine part. Your drawing must be orthographically correct and meet ANSI drawing standards.

2. The CRM must test all performance elements contained in the performance objective. In the previous example there is only one performance required: "draw a two-view detail". However, if the performance element reads: "draw and dimension a....", then the CRM would read:

Draw and dimension a two-view detail drawing of a machine part. Your drawing must be orthographically correct and meet ANSI drawing standards.

3. The same standard or criterion must be used to evaluate the performance of the student. Suppose a performance objective stated:

Performance Objective

Given a two page rough draft and typewriting directions, type a final manuscript with all errors corrected at a product on rate of 30 words per minute.

Criterion-Referenced Measure

Obtain a manuscript from the teacher and type it at 25 WPM with only one error.

The problem with this CRM is that the criterion/standard is not the same as the one for the performance objective.

4. The same terminology should be used in writing the CRM as is used in the performance objective. If the performance objective states TYPE A BUSINESS LETTER..., then the CRM must use the word TYPE, not PREPARE, WRITE, or DEVELOP.
5. The CRM should require the same conditions to be met during the testing as were stated in the performance objective. For example, if an Accounting I teacher requires the students to use their memory in solving problems, then the CRM should require the same condition. If a student is required to extract information from a newspaper for demonstrating some competency, then the CRM should use a newspaper as a condition of the testing.
6. Although the criterion or standard is not required to be stated in the CRM, it is helpful sometimes to include the standard. By doing this, the student knows how and to what criterion the performance will be evaluated. Therefore, it is helpful to include both a description of how the testing is to be conducted, as well as the criterion for evaluation.
7. Do not include additional skills or knowledge in the CRM if they are not contained in the performance objective. The purpose of the CRM is to test the performance objective and not other skills and knowledge. If it is important to evaluate principles, minor skills, and knowledge, use additional tests to obtain this information. The following example illustrates this principle.

Performance Objective

Given 15 letters and documents for filing and filing directions, file all letters and documents alphabetically without error.

Criterion-Referenced Measure

Obtain materials to be filed from the instructor, file without error, and pass a written test on filing terminology.

The problem with this CRM is that an additional test or requirement has been added. The CRM should only test the performance required in the performance objective. The filing terminology is useful and probably will be demonstrated by the student. However, the terminology test should be given during the teaching-learning process to test student knowledge of certain enabling objectives.

Writing CRM's

If criterion-referenced measures cannot be selected from resource materials, then they must be written for each task/competency. Thus the following steps should be used as a guide for writing CRM's.

1. Study the performance objective to determine the type of performance or behavior required. Is it a skill, knowledge, or attitude, value or feeling?
2. Next identify the standard(s) which are used to evaluate the student's performance.
3. Determine what condition, equipment, materials, etc. will be required to evaluate the student's performance.
4. Then write the criterion-referenced measure.
5. Finally, review and evaluate the CRM by answering the following questions:
 - a. Is the same performance tested by the CRM as identified in the performance objective?
 - b. Does the evaluation standard(s) used to measure student performance in the CRM agree with the performance objective standard(s)?
 - c. Are the same conditions (equipment, materials, environment) used for both the CRM and performance objectives?
 - d. Is the terminology in the CRM and performance objective compatible?
 - e. Does the CRM test all skills, knowledge, and/or attitudes included in the performance objectives?

- 6 The final step is the testing of the CRM's in the program to determine whether the students understand the testing directions and whether the CRM really measures the performance stated in the performance objective.

Sample criterion-referenced measures for various vocational programs are included on pages 121-122.

CRITERION-REFERENCED TESTING PROCEDURES

So far, the selection and development of criterion-referenced measures has been discussed. The use of criterion-referenced measures in the testing phase of a vocational program is both required and critical for a successful program. Then how are CRM's integrated into the testing program? First of all, it is important to realize that the requirement to use a CRM to test each performance objective does not mean that all other types of testing can be discontinued. Criterion-referenced testing is one of the major evaluation components of a competency-based program but not the only one. The major purpose of the criterion-referenced testing procedure is to determine whether the student has achieved the predetermined level of performance of the competency identified for the vocational program. There still is a need for testing enabling skills and knowledge which are necessary to reach the proficiency level of the competency. Thus, testing in CBE requires **both** process testing of the learning of enabling skills/knowledge and product testing for achievement of the competency. The relationship between the process and product testing phases in a competency-based program is illustrated in figure 4 on page 103.

Therefore, the process testing is concerned with evaluating the student's progress toward the goal of mastering the competency, while the product testing, using the criterion-referenced measure, is used to determine mastery of the competency. Both forms of testing are required in CBE. Finally, the documentation of the competency on the competency record/

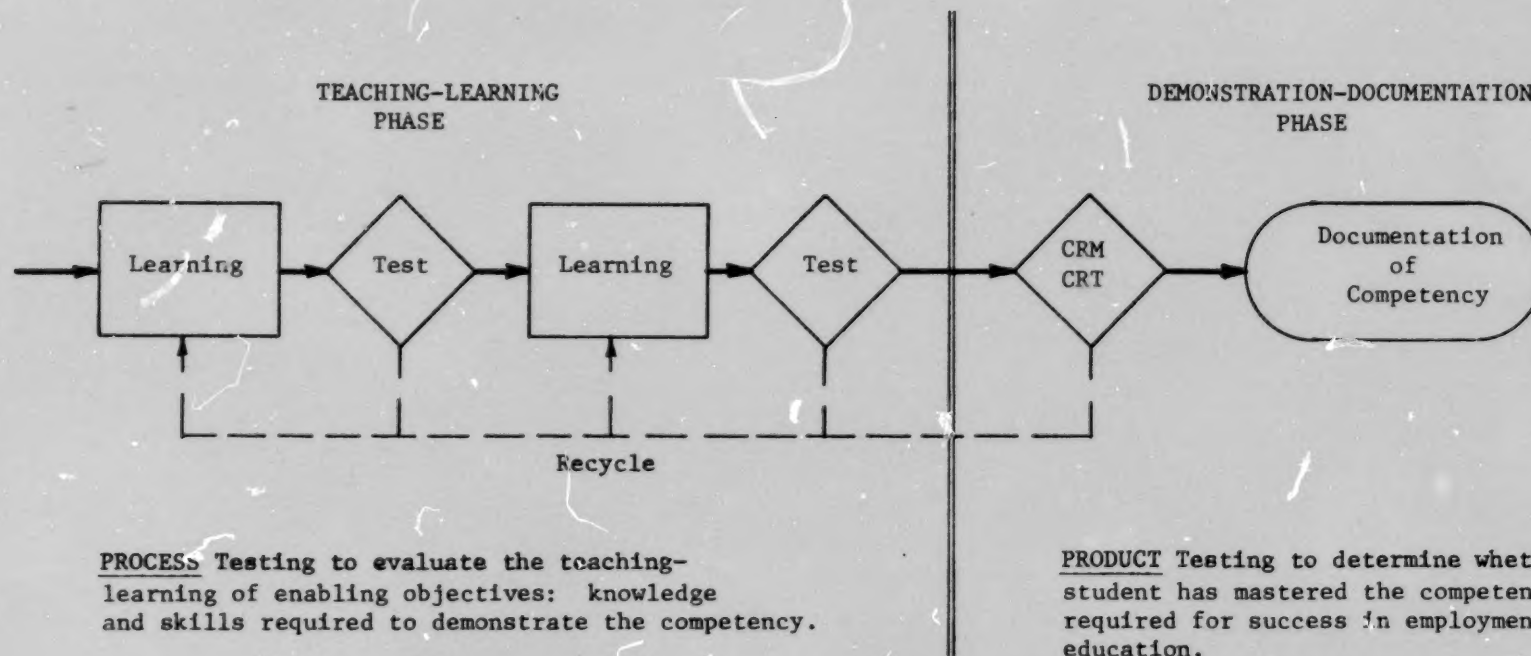


Figure 4

The Relationship Between Process and Product Testing

profile (see SECTION V) is based on the results of the criterion-reference test and not on the other tests given during the teaching-learning phase of the program.

SUMMARY

The evaluation of performance in competency-based education is important to the teacher and student. For the teacher, criterion-referenced testing provides specific information on each student's level of performance in mastering competencies and serves as a basis for documenting competency achievement. Students benefit from knowing what criterion/standard will be applied in evaluating achievement. In addition, students are tested on the same skills, knowledge, and attitudes which have been practiced during the teaching-learning process.

The use of criterion-referenced measures to test the performance objective does not eliminate the need for other types of testing. During the teaching-learning phase of the program, testing is required to determine student progress and effectiveness of teaching strategies. Therefore, both process and product evaluation are required in vocational programs.

Finally, the use of criterion-referenced measures and testing procedures are key elements of CBE and are required by Virginia CBE Standards. Without criterion-referenced testing, it would be difficult to determine whether a student possesses the necessary skills, knowledge, and attitudes for employment and education.

CBE STANDARD III CHECKLIST

The purpose of this checklist is to assist the teacher or administrator in implementing CBE Standard III in a vocational program: "Criterion-referenced measures are used to measure achievement of competencies."

- A. There is a criterion-referenced measure (CRM) for each validated task/competency.
- B. The CRM tests the skills, knowledge, or attitudes stated in the performance objective (PO).
- C. Both the CRM and PO use the same criterion/standard performance level.
- D. The testing and evaluation procedure is based on a predetermined standard for the task/competency.
- E. CRM terminology and wording is clear and concise.
- F. The CRM testing conditions are the same as stated in the performance objective.
- G. Student achievement and performance are based on a criterion/standard rather than other students' achievement.

YES	NO	?

EVALUATION: A vocational program complies with Virginia CBE Standard III, when all items are checked YES.

SAMPLE MATERIALS

INSTRUCTOR CHECKLIST

Competency: Post entries from journals to ledger.

ACTIVITY	RATING	
	Acceptable	Unacceptable
* 1. Selected appropriate account.		
2. Recorded date.		
3. Recorded source.		
* 4. Debited or credited account correctly.		
5. Calculated balance where appropriate.		
6. Posted to subsidiary.		
7. Posted to control account.		
8. Recorded posting references in journal.		

*Can have no more than two errors in these items.

Source: V-TECS

RATING SCALE

MODULE 12 (MUFFIN VARIATION)

The following rating scale is used to evaluate your skills in preparing muffins.

SCORE FOR MUFFINS

APPEARANCE: Golden brown color.
Gently rounded top, pebbly
rather than smooth. Creamy
white inside.

- ☐ Perfect....4 ☐ Fair....2
☐ Good.....3 ☐ Poor....1

TENDERNESS: Breaks easily without
crumbling. Light and tender.

- ☐ Perfect....4 ☐ Fair....2
☐ Good.....3 ☐ Poor....1

TEXTURE: Uniform, medium texture.
Slightly moist. Free of tunnels.

- ☐ Perfect....4 ☐ Fair....2
☐ Good.....3 ☐ Poor....1

FLAVOR: Delicate, slightly
sweet, pleasing.

- ☐ Perfect....4 ☐ Fair....2
☐ Good.....3 ☐ Poor....1

Poor Characteristics
Peaked, smooth, crust
Knobbed top
Pale

Burned

Tough, "elastic"

Tunnels, very compact

Waxy, shiny

Unpleasant flavor

Here's Why
Overmixed
Overmixed
Too cool oven

Too hot oven

Overmixed
Too much flour

Overmixed

Insufficient
mixing of egg
and milk

Old or low
quality
ingredients

ADD YOUR SCORE

Appearance _____
Tenderness _____
Texture _____
Flavor _____
TOTAL _____

student

date

PRINT READABILITY RATING SCALE
Basic Technical Drawing (8435)

The purpose of this rating scale is to evaluate the readability of prints made from original drawings. A print is acceptable when all readability criteria are checked ACCEPTABLE.

READABILITY CRITERIA	ACCEPTABLE	UNACCEPTABLE
1. Has dark and clear lines		
2. Has a light background		
3. Has clear dimensions and notes		
4. Is reproduced on the appropriate size paper		
5. Has appropriate paper type for the job		
6. Has an image which is parallel and square with the paper edge		



INDUSTRIAL ARTS EDUCATION SERVICE
COMMONWEALTH OF VIRGINIA

GRAPHIC COMMUNICATIONS 1

Psychomotor Evaluation

Student Directions: This exercise is designed to evaluate the skills you have developed in completing this graphic communications course. Using the tools, equipment, and supplies listed below, follow the directions to:

1. Plan the production of a poster and/or ad flyer.
2. Utilize the graphic communication design principles.
3. Utilize a thumbnail sketch, rough layout, and comprehensive layout.
4. Produce a mechanical layout to be used as camera copy.
5. Produce a "line copy" negative of the design.
6. Strip negative and use in making a plate.
7. Print the poster and/or ad flyer.

After completion of the project, answer all the questions listed related to it.

Supplies Required:

Layout paper

Appropriate clip art or preprinted type

Photocomposition paper (Stripprinter or headliner)

Photographic type fonts

Strike-on composition

Rubber cement

Ortho film and processing chemicals

Masking sheet

Offset plate and processing chemicals

Stock to be printed, ink

Cello tape

Opaque and brush

Equipment to be Utilized:

All of the necessary graphic communications tools, cameras, darkroom materials, platemaking equipment, composition equipment, and presses are available for your use.

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Graphic Communications I

Psychomotor Evaluation

Name _____

Score _____

Student Number _____

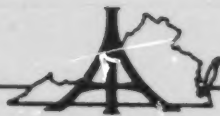
Related Questions:

1. Which style of balance was used in the layout _____?
2. The paper I selected to print on was:
 - a. Kind of paper _____?
 - b. Weight of paper _____?
3. The types of cold type image generation used were:
 - a. _____
 - b. _____
 - c. _____
4. The paper was printed using:
 - a. Kind of ink _____?
 - b. Color of ink _____?
5. Cutting (1) one stock size sheet, I received _____ number of press size sheets.

Competencies Mastered:

- A Safety, Task 2 and 21
- B Job Planning, Task 4, 5, and 6
- C Image Generation, Task 8, 9, 10, and 11
- D Paper Cutting, Task 20
- E Reproduction and Production, Tasks 26, 27, 29, 30, 32, and 35.

Course No. 8421



INDUSTRIAL ARTS EDUCATION SERVICE
COMMONWEALTH OF VIRGINIA

Graphic Communications I

PSYCHOMOTOR EVALUATION

Evaluator Directions: The following criteria should be completed by the evaluator in response to the student's completing his/her project assignment. The criteria listed are to be used by the evaluator in viewing the student's project and effort in his/her "best judgment" based upon the following factors:

1. Laboratory facilities
2. Lab availability of tools/machines
3. Student selection of tools/machines
4. Aesthetic qualities sought by the student
5. Student's physical capabilities
6. Other factors which in the experience of the evaluator would effect the results of the students efforts.

Evaluator's Response: Using the evaluative device provided and the information below, determine which competencies the student has mastered.

1. Were a thumbnail sketch, rough layout, and a comprehensive layout done correctly? _____
2. Were the important design principles for graphic communications used? _____
3. Was a mechanical layout made? _____
4. Were the preprinted type and clip art appropriately utilized by the student? _____
5. Are the quality and appropriateness of the strike-on material satisfactory? _____
6. Are all the lines of composition straight? _____
7. Has the student "set" the phototype correctly? _____
8. Was the phototype properly developed? _____
9. Has all the excess rubber cement been removed from camera ready copy? _____
10. Were the size and style of the phototype appropriate for this project? _____
11. Did the student cut the paper properly to reduce the amount of waste? _____
12. Did the student correctly set the process camera for enlarging, reducing, or shooting his copy? _____
13. Is the negative a "clean negative"? _____
14. Did the student position the negative correctly in the "stripping" operation? _____
15. Was the flat completed properly, opaqued, etc.? _____

Graphic Communications

Psychomotor Evaluation Cont'd

16. Did the student position, expose, and process the plate correctly?
17. Was the press adjusted, so image would print in proper position on paper? _____
18. Was the delivery of press properly set? _____
19. Did student accurately adjust the water/ink to produce a quality print? _____
20. Did the student select the appropriate kind and color of ink for the job? _____
21. Did the student select the proper kind of paper for the job? _____
22. Does the project "sell" the student's idea? _____
23. Did the student handle & use safely all materials and equipment? _____
24. Did the student prepare a "dummy"? _____

Evaluator's Response: All of the evaluator's responses must be correct by category for the student to receive credit for that competency. The following summary is provided to assist you in evaluating students per competency tasks. Circle the letter before the listed competencies the student has mastered on his/her answer sheet.

<u>Test Question</u>	<u>Competency</u>	<u>Task</u>
A. Number 23	Safety	Task 2 and 21
B. Number 1, 2, 10, 22, 24	Job Planning	Task 4, 5, and 6
C. Number 3, 4, 5, 6, 7, 8, and 9	Image Generation	Task 8, 9, 10, and 11
D. Number 11	Paper Cutting	Task 20
E. Number 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21	Reproduction and Production	Task 26, 27, 29, 30, 32, and 35



INDUSTRIAL ARTS EDUCATION SERVICE
COMMONWEALTH OF VIRGINIA

GRAPHIC COMMUNICATIONS 1

Cognitive Evaluation

Student Directions: This test is designed to evaluate the knowledge you have gained by completing your present industrial arts course. Place your name and student number in the spaces provided on the answer sheet. Select and circle the one response which best answers each question. An example is provided.

What solvent should be used in cleaning oil base inks from a silk screen design?

- A. Lacquer thinner
- B. Water
- C. Gasoline
- ☒ D. Mineral spirits
- E. None of the above

The correct answer to the above question is D. You may now proceed to complete the test by circling your responses on the answer sheet. Please do not write on the test.

Knowledge Assessment of Graphic Communications I

1. Which of the following major processes of image transfer is used in making a rubber stamp?
 - A. Gravure
 - B. Offset
 - C. Relief
 - D. Screen Processing
 - E. Electrostatic
2. Eye movement through a design is accomplished by which of the following design principles?
 - A. Balance
 - B. Rhythm
 - C. Unity
 - D. Proportion
 - E. None of the above



INDUSTRIAL ARTS EDUCATION SERVICE
COMMONWEALTH OF VIRGINIA

Graphic Communications I

COGNITIVE EVALUATION

Evaluator Directions: Following are the correct responses to the cognitive evaluation instrument. Please mark the incorrect responses made by the student.

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. C | 11. B | 21. A | 31. B | 41. B |
| 2. B | 12. B | 22. B | 32. C | 42. C |
| 3. C | 13. A | 23. D | 33. A | 43. C |
| 4. A | 14. C | 24. B | 34. D | 44. A |
| 5. B | 15. D | 25. B | 35. C | 45. D |
| 6. A | 16. B | 26. B | 36. B | 46. C |
| 7. D | 17. C | 27. B | 37. E | 47. C |
| 8. B | 18. B | 28. B | 38. D | 48. C |
| 9. C | 19. C | 29. C | 39. C | 49. B |
| 10. B | 20. C | 30. A | 40. B | 50. A |

Evaluator's Response: Using the student's answer and the scale below, determine which competencies the student has mastered. All selections must be correct to receive credit for each competency listed. Circle the letter before the listed competency on the student's answer sheet.

<u>Test Question</u>	<u>Competency</u>	<u>Task</u>
A. Number 1, 14	Processes of Image Transfer	Task 3
B. Number 2, 15, 28, 35, and 46	Design Principles	Task 4
C. Number 3, 16, 27, 34, 45, and 49	Image Generation	Task 7
D. Number 17, 36	Screen Process Printing Needs	Task 15
E. Number 4, 5, 12, 18, 25, 37, 47, and 50	Screen Process Printing Materials	Task 18
F. Number 6, 19, 38, and 42	Types of Paper	Task 19
G. Number 7, 20, 29, 39, and 48	Process Camera	Task 24
H. Number 8, 21, and 30	Photographic Copy	Task 28
I. Number 9, 22, and 31	Offset Plates	Task 30
J. Number 10, 23, and 40	Principle of Offset	Task 31
K. Number 11, 24, 26, 32, and 41	Binding, Finishing, & Packaging	Task 33

LICENSED PRACTICAL NURSING PROGRAM
CLINICAL LAB EVALUATION CHECKLIST

STUDENT _____

COURSE: _____

INSTRUCTOR _____

DATES: _____

to _____

Patient Care	Always provides individualized care with good knowledge of the nursing process; and usually independent of instructor. (8)	Usually provides individualized care with knowledge of the nursing process and minimal instructor direction. (6)	Provides nursing care with some knowledge of the nursing process and some instructor assistance. (4)	Provides nursing care with instructor assistance but demonstrates poor knowledge of the nursing program. (2)	Unable to provide nursing care even with instructor assistance. (0)
Dependability	Can always be depended upon. (8)	Can be depended upon most of the time. (6)	Can be depended upon when interested. (4)	Can rarely be depended upon. (2)	Cannot be depended upon. (0)
Initiative and Industry	Usually completes more than required tasks. (8)	Often completes more than required tasks. (6)	Completes required tasks carefully. (4)	Must be prodded to complete required tasks. (2)	Seldom completes required tasks. (0)
Safety	Always understands and utilizes accepted safety procedures. (8)	Usually understands and utilizes accepted safety procedures. (6)	Often understands and utilizes accepted safety procedures. (4)	Doesn't understand and careless using accepted safety procedures. (2)	Rarely identifies need or utilizes accepted safety procedures. (0)
Technique	Demonstrates exceptional ease with equipment and thorough knowledge of procedure. (8)	Usually at ease with equipment and understands procedure. (6)	Minimal awkwardness with equipment and basic understanding of procedure. (4)	Awkward with equipment but has basic understanding of procedure. (2)	Awkward with equipment and poor understanding of procedure. (0)
Personal Appearance	Exceedingly attractive and well groomed. (4)	Pleasing appearance. (3)	Acceptable appearance (meets program requirement). (2)	Careless about appearance. (1)	Unkempt; untidy (0)
Emotional Control	Exceedingly poised (4)	Controls self with ease (3)	Usually has emotional control. (2)	Emotional (1)	Lacks emotional control. (0)
Adaptability	Adapts readily to assignment changes. (4)	Usually adapts to changes in assignment. (3)	At ease with change when interested. (2)	Ill at ease following assignment changes. (1)	Unable to adjust to change. (0)
Attitude Towards Others	Always agreeable, cooperative and tactful. (4)	Usually agreeable, cooperative and tactful. (3)	Often agreeable and cooperative. (2)	Agreeable only when interested, uncooperative. (1)	Disagreeable, tactless and uncooperative. (0)
Mental Ability	Able to solve difficult problems. (4)	Usually able to solve difficult problems. (3)	Able to solve problems of average difficulty. (2)	Finds most problems difficult to solve. (1)	Not interested in mental activity. (0)
Service to Others	Extremely sensitive to opportunities to help others. (4)	Willing to help others at personal inconvenience. (3)	Willing to assist others in group activities. (2)	Will help others if not inconvenienced. (1)	Willing to help others only for personal benefit. (0)
Reaction to Suggestion and Criticism	Always accepts and responds to suggestions for improvement. (4)	Always accepts and usually responds to suggestions for improvement. (3)	Usually accepts and rarely responds to suggestions for improvement. (2)	Usually accepts and rarely responds to suggestions for improvement. (1)	Rarely accepts or responds to suggestions for improvement. (0)
Communication	Very pleasant voice, excellent diction and always uses proper terminology. (4)	Pleasant voice, good diction, and usually uses proper terminology. (3)	Acceptable voice, fair diction and often uses proper terminology. (2)	Unpleasant voice, poor diction rarely uses proper terminology. (1)	Unpleasant voice and definite speech defects and lacks proper terminology. (0)
Leadership Capacity	Very able leader (4)	Good leader (3)	Good leader if interested in the activity. (2)	Poor leader (1)	Cannot accept leadership responsibility. (0)
Attendance	Never tardy and minimal time lost. (4)	Seldom tardy or absent (3)	Occasionally tardy or absent. (2)	Often tardy or absent. (1)	Consistently tardy or absent. (0)



INDUSTRIAL ARTS EDUCATION SERVICE
COMMONWEALTH OF VIRGINIA

GRAPHIC COMMUNICATIONS 1

Affective Evaluation

Student Directions: This survey is designed to evaluate the attitudes you have acquired by completing your present industrial arts course. Place your name and student number in the spaces provided on the answer sheet. Select and circle the one response which most nearly describes your opinion of each statement. An example is provided.

Key: SD - Strongly Disagree
D - Disagree
U - Uncertain
A - Agree
SA - Strongly Agree

Example: SD D U **A** SA
I feel that by studying
industrial arts, students
develop pride in work well
done.

The response indicates that the individual agrees with the item stated. You may now proceed to complete the survey by circling your responses on the answer sheet. Please do not write on the survey.

Attitude Assessment of Graphic Communications I

1. I feel I have developed an awareness of the purpose of graphic arts technology.
2. I have gained an awareness of occupations in graphic communications technology.
3. I feel I can work more cooperatively with my peers since enrolling in graphic communications.
4. I have not gained an awareness of safety procedures for graphic communications.
5. I feel that from my experiences I have gained skills in graphic communication design principles.
6. I feel that I have developed leadership abilities from working with my fellow students.
7. I feel I can list some of the various uses of graphic arts technology.

Course No. 8421



INDUSTRIAL ARTS EDUCATION SERVICE
COMMONWEALTH OF VIRGINIA

Graphic Communications I

AFFECTIVE EVALUATION

Evaluator Directions: Following are the weighted responses to the affective evaluation instrument. SD and D choices indicate negative responses, and A and SA choices indicate positive responses. Please mark the items that do not correlate to the positive (+) or negative (-) responses that follow. Uncertain responses should be marked wrong.

- | | | | |
|------|-------|-------|-------|
| 1. + | 7. + | 13. - | 19. - |
| 2. + | 8. + | 14. + | 20. - |
| 3. + | 9. + | 15. - | 21. - |
| 4. - | 10. + | 16. - | 22. + |
| 5. + | 11. + | 17. - | 23. + |
| 6. + | 12. - | 18. - | 24. - |

Evaluator's Response: Using the student's responses and the scale below, determine which competencies the student has mastered. All selections must be correct to receive credit for each competency listed. Circle the letter before the listed competency on the answer sheet.

- | | | |
|------------------------------------|--|------------|
| A. Number 1, 7, 11, 12, 17, and 21 | Purpose and Influence of Graphic Arts Technology | Task 1 |
| B. Number 4, 9, 19, 22 | Safe Use of Materials & Equipment | Task 2 |
| C. Number 5 and 15 | Design Principles | Task 4 |
| D. Number 23 and 24 | Screen Process Materials & Equipment | Task 15 |
| E. Number 2, 8, 13, 18 | Graphic Arts Occupations | Task 36 |
| F. Number 3, 6, 10, 14, 16, and 20 | Leadership/Fellowship | Task AIASA |

SAMPLE CRITERION-REFERENCED MEASURES

The following criterion-referenced measures (CRM) have been developed for the performance objectives listed for each vocational area:

AGRICULTURAL EDUCATION

PO: Given a tractor with ballast weights, necessary tools, weights, and instruction manual, remove or add ballast weights. The weights must be bolted securely in place with no excessive movement when attached.

CRM: Your instructor will provide you with a tractor with ballast weights, necessary tools, and operator's manual. Remove or add ballast weights.

BUSINESS EDUCATION

PO: Given 15 documents for filing and filing directions, correctly index, code, sort, and file alphabetically all 15 documents.

CRM: Index, code, sort, and file alphabetically 15 documents.

DISTRIBUTIVE EDUCATION

PO: Provided with information on marketing strategies and factors which affect marketing strategies, demonstrate your knowledge of marketing strategies on a written test. Successful achievement will be realized with a score of 75% on the marketing test.

CRM: Demonstrate your knowledge of marketing strategies on a test by scoring at least 75%.

HEALTH EDUCATION

PO: After adequate instruction/demonstration, provide safe nursing care to the postpartum maternity patient. Acceptable nursing care will be demonstrated with a score of 70% on the Clinical Performance Rating Scale.

CRM: Provide nursing care for a postpartum maternity patient.

HOME ECONOMICS

PO: Provided with accurate consumer information and three products, select the "best buy" product, based on the consumer information. Your choice must match the product selected by the instructor.

CRM: Select the "best buy" product based on accurate consumer information.

INDUSTRIAL ARTS EDUCATION

- PO: *Provided with information on working drawings used in construction, identify foundation drawings and details. The foundation drawing must be selected from a set of working drawings and foundation details identified.*
- CRM: *Identify foundation plans and details in a set of construction working drawings.*

TRADE AND INDUSTRIAL EDUCATION

- PO: *Given range circuit demand data and layout specifications, install a range circuit. The installation must comply with all electrical codes and accepted trade workmanship practices.*
- CRM: *Install a range circuit in accordance with electrical codes and trade practices.*

SECTION V

"A system exists for documenting the competencies achieved by each student."

In this section, the following implementation steps are presented:

9	DEVELOP RECORDING SYSTEM
10	IMPLEMENT AND EVALUATE

The fourth Virginia CBE Standard requires the use of a competency recording system in vocational programs:

A SYSTEM EXISTS FOR DOCUMENTING THE
COMPETENCIES ACHIEVED BY EACH STUDENT.

The basic purpose for the documentation system is to record student achievement in the vocational program, course, or unit of instruction. Why require a documentation system if there is a permanent record of student grades? There are several answers to this question. First, a vocational program is composed of many competencies in the skill, knowledge, and attitude areas. Because of the complexity of most vocational programs, a single grade or series of grades does not document completely the competencies acquired by each student. Thus, the competency recording system provides additional information that usually is not available when letter grades are the only system for recording student achievement. Secondly, many purposes and needs are met by using competency recording systems. The competency record:

1. Provides detailed information to the employer concerning the skills, knowledge, and attitudes possessed by the student.
2. Assists the teacher in recording and documenting student achievement.
3. Assists the teacher in overall evaluation of the student during the grading period.
4. Facilitates the articulation of students between schools and educational levels.
5. Assists student placement personnel in matching students and jobs.
6. Provides specific information to the advisory committee and the public concerning a vocational program's goals and content.
7. Provides parents with detailed information concerning their child's achievement.

8. Provides for accountability in the vocational program.
9. Assists vocational administrators and state staff in evaluating the program and providing services.

Finally, the competency record/profile is a unique characteristic of competency-based programs, which assists in making the instructional program successful. It is important to understand that the competency record/profile is not a replacement for course grades but a useful supplement to the present grading system.

The purpose of this section is to discuss the development, selection, and use of competency recording systems for vocational education. The management of these systems is discussed as well as program evaluation, the final implementation step.

What is required for documenting the competencies achieved by each student? According to State CBE criteria, the competency record/profile will include (1) student name; (2) program title; (3) listing of all terminal competencies; (4) enabling competencies, if needed; (5) rating scale; and (6) method for authenticating the record. Furthermore, the documentation materials are to be available or designed for articulation, student achievement records, and employer information purposes. It is also suggested that the documentation materials be included as a part of the student's official school record.

RATING SCALES AND GRADES

There have been many questions and concerns expressed regarding the relationship between the rating scale used on the competency record/profile and the final grade given in the vocational course. Before discussing this relationship, the definition for rating scale needs to be presented with several examples. A rating scale is defined as: "a narrative

description of student performance in relation to the set criterion/standard for the task/competency." There are many examples of rating scales for vocational programs. One rating scale currently being used is as follows:

- 4 - CAN PERFORM THE TASK/COMPETENCY ABOVE THE CRITERIA AND ASSIST OTHERS
- 3 - CAN PERFORM THE TASK/COMPETENCY ABOVE THE CRITERIA WITH NORMAL SUPERVISION
- 2 - CAN PERFORM THE TASK/COMPETENCY AT THE CRITERIA
- 1 - CANNOT PERFORM THE TASK/COMPETENCY BUT KNOWS PARTS OF THE TASK
- 0 - HAS NOT ATTEMPTED THE TASK/COMPETENCY

The rating scale is used to document the student's performance level in relation to the criterion/standard for the task/competency. Therefore, the rating is a measure of the skill, knowledge, or attitude performance for a specific competency.

The course grade, which is issued at regular intervals, may be determined by or constitute many variables such as attendance, behavior, scores on tests, competency performance, and the number of competencies achieved for a given grading period.

Therefore, rating scale evaluations are a specific measure of student performance on an individual competency, while the course grade is a general measure of overall achievement. This relationship is important when developing or using recording system materials. The student and teacher must have a clear understanding of the differences and uses for rating scales and course grades.

Finally, it should be noted that the competency profile is not a replacement for, nor intended to limit, the value of course grades. The competency

record really is a tool to supplement the regular grading system.

Grade Translation

Because the rating scale is used to evaluate a student's performance relative to the standard/criterion, there is a need to translate this rating into a grade. The process for translation of ratings into grades is important to the teacher and student. For the teacher, achievement ratings for individual competencies are one basis for calculating course grades. The student is interested in grade averages, class standing, and overall achievement in the course. There are several methods for calculating grades from competency rating scales. One such method assigns a letter grade or percentage to each rating value, as follows:

- 4 - CAN PERFORM THE TASK/COMPETENCY ABOVE THE = A or 95%-100%
CRITERIA AND ASSIST OTHERS.
- 3 - CAN PERFORM THE TASK/COMPETENCY ABOVE THE = B or 90%-94%
CRITERIA WITH NORMAL SUPERVISION
- 2 - CAN PERFORM THE TASK/COMPETENCY AT THE = C or 85%-89%
CRITERIA
- 1 - CANNOT PERFORM THE TASK/COMPETENCY BUT = D or 80%-84%
KNOWS PART OF THE TASK
- 0 - HAS NOT ATTEMPTED THE TASK/COMPETENCY = No Grade

The grades for each task/competency can then be averaged to calculate the overall grade for a grading period. If the number of competencies achieved during a fixed period of time is important, then a factor will need to be used in calculating grade average.

Another method for determining overall grades for a series of competencies achieved is the grading of a project. The project can include a series of related competencies, with each competency being evaluated using the rating scale. However, the overall project is graded according to the criteria established by the instructor. The project grade is averaged with other

projects, tests, homework, etc. to determine the grade for the period.

In many vocational courses, a number of factors are used to determine the final grade for a grading period. These factors: projects, papers, tests, attendance, attitude, etc., usually are weighted and averaged in determining the final grade. The following example illustrates how ratings on competencies and other variables are averaged in computing the final grade:

STUDENT "A"

ITEM	AVERAGE
1. Completed and demonstrated 75 competencies with an average rating of 2 = 85%	85%
2. Test average for 2 tests = 87%	87%
3. Attendance = 100%	100%
4. Shop and Class Behavior	90%

WEIGHTED AVERAGES

1. 85 = 75% of final grade
2. 87 = 15% of final grade
3. 100 = 5% of final grade
4. 90 = 5% of final grade

COMPUTATION OF FINAL GRADE

$$\begin{array}{r}
 .85 \times .75 = .6375 \\
 .87 \times .15 = .1305 \\
 1.00 \times .05 = .0500 \\
 .90 \times .05 = .0450 \\
 \hline
 .8630 = 86\% \text{ or B}
 \end{array}$$

Therefore, competencies can be evaluated using a rating scale and a final grade determined by translating competency ratings into grades or percentages. It is important to remember that CBE and the use of rating scales does not eliminate the need for determining grades for a given period. Actually, CBE rating scales can assist both the teacher and the student by making grade calculations more objective.

DEVELOPING COMPETENCY PROFILES/RECORDS

There are numerous competency profile/record models and formats available for vocational programs. Therefore, it is suggested that vocational teachers obtain existing examples and review them for possible adoption before beginning to develop a record/profile. In selecting competency profile/record formats for a particular program, the present methods for documenting student achievement, filing system and record storage facilities, and the local needs should be reviewed. Therefore, the following questions should be addressed when selecting a competency profile/record:

1. Does the record/profile comply with state CBE requirements and criteria? The document must include or be modified to include 1) student name; 2) program title; 3) listing of all competencies; 4) enabling competencies, if needed; 5) rating scale; and 6) method for authenticating the record.
2. Is the rating scale appropriate and suitable to evaluate student performance? It is very important that the rating scale narrative descriptions be appropriate for the vocational program. In addition, the rating scale must be specific enough to avoid misinterpretation. For example, "good" and "excellent" rating scale should be avoided since these terms are subject to interpretation by the persons reviewing the record/profile.
3. Are there provisions for including the documentation of competencies for all three domains? Competencies for skills, knowledge, and attitudes are included in the vocational program. Therefore, there is a need to document these competencies on the record/profile.
4. Will the format or size be compatible with the present filing and record system? It is important that the selected system be compatible with the current recording system files. Some thought should be given as to whether individual competency profiles for each student or group records for the entire class will be maintained.
5. Can the competency profile/record be copied or duplicated for use by the student, parent and employer? Some competency records have multiple copies, while others must be copied for use by the student, employer and school personnel.
6. Are there provisions for including additional competencies on the profile/record? There may be a need to list additional tasks/competencies on the recording document. Therefore, it is important that extra space be provided.

Whether a teacher selects or develops a competency profile/record, it is important that the document meet the needs of the student, teacher, program, and employer.

If a suitable competency record/profile cannot be selected or modified, then it must be developed. The development and design should be carefully planned. Before discussing the development of competency records and profiles, the State requirements for documentation systems should be reviewed. According to State CBE Standards, the record/profile must include the following elements:

1. Student name. The complete name of the student must be included for identification purposes by the various users: teacher, parent, student, employer, and school personnel. Additional information such as social security number, home address, etc., while not required, is helpful.
2. Program title. The title of the vocational program is useful for the general identification of the competency record/profile. Although not required, occupation job title or domain is useful to prospective employers. The program identification also is useful for evaluation purposes.
3. Listing of all terminal competencies. The record must include a list of all competencies required for the particular program. This will provide an overview of the content of the program to the student, parent, and employer.
4. Enabling competencies, if needed. Many vocational programs contain minor but important competencies which should be listed and documented. These enabling competencies are necessary for the student's success in later coursework and on the job. It is not required by Virginia CBE Standards to include enabling competencies on competency records; however, it may be useful to document them for basic, general, and exploratory courses.
5. Rating scale. Perhaps the most important component of the competency record is the rating scale. The rating scale provides specific information concerning the student's performance in relation to the pre-determined standard. Since evaluation of student performance in CBE is criterion-referenced, the recording of the performance must be related to the competency criterion/standard.
6. Method for authenticating. Because of the importance of recording system documents, which are as valuable as transcripts, a method

of authenticating the records information is necessary. The instructor's signature, vocational director's signature, or school seal are several methods for authenticating these documents.

Rating Scales

Without a rating scale, the competency record/profile is of limited value. The rating scale provides specific information concerning the student's performance in relation to the competency criterion/standard. For example, if a competency in a typewriting course requires: 40 WPM WITH ONE ERROR, student performance above and below this criterion/standard level can be documented on the competency record/profile. Therefore, the rating scale allows the teacher to document superior performance as well as partial performance. This is important to the student, parent, and employer. Even if a student cannot reach the entry-level performance, the student should be given credit for what has been demonstrated. Certainly, superior student performance should be documented because it is possible that the employer may give advanced job placement to the student.

When developing rating scales, single word scales using EXCELLENT, GOOD, AVERAGE, and POOR should be avoided since these words are subject to interpretation and various meanings by the teacher. The term GOOD may mean EXCELLENT to another teacher. Terminology must be used to describe performance in relation to the competency criterion/standard. For example, CAN PERFORM THE TASK AT THE ENTRY LEVEL WITH NORMAL SUPERVISION is certainly more descriptive than GOOD. There are many examples of rating scales used on competency profiles/records; among these, the following has been used successfully:

- 4 - CAN PERFORM THE TASK/COMPETENCY ABOVE THE CRITERION/STANDARD AND LEAD OTHERS IN PERFORMING THE TASK.
- 3 - CAN PERFORM THE TASK/COMPETENCY AT THE CRITERION/STANDARD LEVEL WITH MINIMAL SUPERVISION.

- 2 - CAN PERFORM MOST OF THE TASK/COMPETENCY,
NEEDS SUPERVISION.
- 1 - CANNOT PERFORM THE TASK BUT POSSESSES THE
TECHNICAL KNOWLEDGE.
- 0 - HAS NOT ATTEMPTED THE TASK.
- P - TASK ACCOMPLISHED BY PRETEST, ARTICULATION
OR PREVIOUS TRAINING/JOB EXPERIENCE.
- E - EQUIPMENT OR MATERIALS NOT AVAILABLE BUT
TECHNICAL KNOWLEDGE TAUGHT.

In the sample provided, two additional ratings or conditions have been included. The "P" rating allows a teacher to document task/competency accomplishments that have been demonstrated by pre-testing, articulation, or previous job experiences. When a vocational program does not have the equipment or materials to teach a specific task/competency, but the technical knowledge is taught, the letter "E" is placed on the record/profile. Additional examples are included on the sample records/profiles shown on pages 145-155.

Competency Coding

Because there may be a large number of task/competencies listed on the record/profile, a coding or numbering system should be used. It is helpful if the same coding or numbering system used in state approved instructional resource materials or other resource materials is used on the recording system. If a teacher currently is coding the performance objectives used in the vocational course, then the same code numbers should be used. This will assist the teacher in ensuring that all tasks/competencies are included on the record/profile. There are many methods for coding the competencies on the record/profile, the following is one example:

1.00 - DUTY AREA, CONTENT/CONCEPT
AREA OR UNIT OF INSTRUCTION

1.1 TASK/COMPETENCY
1.2 TASK/COMPETENCY
1.3 TASK/COMPETENCY

or

A - DUTY AREA, CONTENT/CONCEPT AREA
OR UNIT OF INSTRUCTION

A1 TASK/COMPETENCY
A2 TASK/COMPETENCY
A3 TASK/COMPETENCY

When it is desirable to include enabling competencies on the record/profile, an additional code number or letter should be used to indicate the difference between the terminal and enabling competencies. Using the two previous examples, this might be indicated as follows:

1.3 TASK/COMPETENCY

1.3.1 ENABLING TASK/COMPETENCY
1.3.2 ENABLING TASK/COMPETENCY

or

A3 TASK/COMPETENCY

A3.1 ENABLING TASK/COMPETENCY
A3.2 ENABLING TASK/COMPETENCY

Whether a system uses letters, numbers, or a combination is not as important as ensuring that all terminal competencies are included on the record/profile. Therefore, the performance objectives for the vocational program are documented by including all terminal competencies on the profile/record.

Sample competency record/profiles and documentation systems which are currently used in vocational programs, are included on pages 145-154.

MANAGEMENT OF COMPETENCY PROFILES/RECORDS

Once the selection or development of a competency profile/record has been completed, the management of the profile/record should be considered. Because the documentation system serves many purposes--articulation information, a record of student achievement, pre-employment information, and student

placement data, the management of the document is important. In considering the management of profiles and records, one should consider these questions:

1. Will there be an individual profile/record maintained for each student or will a group/class system be used? The Virginia CBE Standards do not require an individual record for each student, but task/competency achievement information on each student is required. It should be pointed out that in order to provide copies for articulation, student records and employer information, an individual record/profile is more useful. If the individual recording system is not used, then information will have to be transferred to another record for each student to meet a specific use.
2. Where will record/profiles be filed for current and former students? Since the information on the competency record/profile is valuable to student, teacher, school placement staff, parent, and employer, a filing system is required. After a student leaves the vocational program these records should be maintained for future retrieval. The microfilming of the record/profile will save filing space. It is suggested that a copy of the record/profile be placed in the student's permanent file.
3. Will competency record/profiles be standardized for a program, school or district? There is a benefit in using the same format within the program, school or district. Standardization can assist teachers, students, parents and employers to understand the documentation system. Perhaps the record/profile should be standardized as is the permanent record and the report card. Filing systems are easier to maintain if the documents are a standard size and format.
4. If a student has more than one teacher in the vocational program, how will the record/profile be maintained? Some thought needs to be given if more than one teacher is involved in a vocational program. Will students carry their records to each class, or will instructors enter information on the record at the end of each grading period? When there is more than one teacher, an agreement should be worked out between or among those involved.
5. How will record/profiles be maintained to protect confidentiality? Because the documentation system is considered a confidential record, then security provisions for the record/profile must be made. A release statement should be executed so the document can be released to placement personnel and prospective employers.

6. When a teacher resigns or leaves a school, what happens to the competency record/profiles of current and former students?
The information contained in a record/profile is valuable and is difficult to re-document. Therefore, competency documents need to be turned in by departing teachers. These documents will be helpful to the new teacher in determining where each student is in the program.

The important point to remember when considering a management system for competency profile/records is that the teacher's needs are not the only criterion for selection. There are many other uses for these records, and this must be considered when developing a management system. A combination management system and recording document is included on pages 79-84.

Computerized Management

There are a number of school systems which use a computer to manage student achievement data and competency records. Hampton City School System currently is using a computerized student profile reporting system for its vocational programs. The system is designed to enable a teacher to enter a student's performance rating for each competency identified for the vocational program or course. An OPSCAN sheet is used by the teacher to record individual student performance. The computer system also maintains a current record of each student's status in the program. At certain times, reports such as the following are prepared by the computer center staff:

STUDENT SKILLS PROFILE. Designed to let the student see, at a glance, how well he/she has done to date on the competencies for the course. This information will allow the student to know the areas in which he/she will need to work to complete the course.

SCHOOL SKILLS PROFILE. Designed to let the teacher see, at a glance, the progress of the class on the competencies for the course. This will provide the teacher with important information for making teaching decisions and plans.

DIVISION SKILLS PROFILE. Designed to let the supervisor see the progress of an entire division on the competencies for a particular course. With this information, the supervisor can make decisions regarding curriculum revision, resources, and materials.

The reports assist the teacher and administrator in meeting the specific needs of the student in the vocational program. A copy of the OPSCAN form and reports are included on pages 155-158.

IMPLEMENTING AND EVALUATING CBE

In previous sections of this guide, a series of implementation steps and information have been presented. The final step in the implementation process is the actual start up of the program in a competency-based format and the evaluation of its effectiveness. The purpose of this discussion is to provide information on how to evaluate the effectiveness of the competency-based program. This evaluation procedure is limited to the teacher's program evaluation and does not include evaluations conducted by local and state supervisory staff.

Why should teachers be interested in evaluating the materials and program effectiveness? First, instructional materials which have been newly developed or selected for the competency-based program need to be tested to determine whether they convey the necessary information and provide the skills, knowledge, and attitudes required for mastery of the competency by the student. Evaluation of program effectiveness also can identify additional instructional activities to be included in the program. Therefore, the instructional materials as a complete package should be evaluated.

Another area of evaluation as it relates to instruction concerns the management of instruction. The procedures for delivery and management should be tested to determine whether the system meets individual student and local program needs. Finally, program evaluation will help determine whether students are learning and acquiring the necessary skills, knowledge, and attitudes for success on the job and in education.

Instructional effectiveness can be evaluated in two ways: by process and product. The instructional process evaluation measures effectiveness of teaching, instructional materials, instructional method, management of instruction, and other features of the teaching-learning process. Product evaluation deals with the question of learning outcomes, in other words, are students acquiring the required competencies for success on the job and in education?

When evaluating instructional process, there are many questions which can be addressed by the evaluation instrument:

1. Are the instructional materials appropriate for the competency being taught?
2. Are the directions and terminology clear, concise, and suited to the learner's needs?
3. Are there additional activities which need to be included?
4. Do students learn from using the instructional material?
5. Is the learning sequence and presentation appropriate for the student and setting?
6. Is the instructional management system (lesson plan, job sheets, competency sheets, contracts, etc.) effective for delivery of instruction?
7. Is the amount of material presented in a lesson or unit of instruction appropriate for the objectives?

These are only a few of the questions which should be included in the process evaluation. The specific questions or areas of evaluation depend on the program area, type of instructional materials, and local needs. A sample evaluation form used to evaluate one type of instructional material is included on page 159.

The other aspect of instructional effectiveness evaluation deals with the final product: the measuring of instructional outcomes. Product

evaluation involves the collection of information concerning whether the goals and objectives of the program are achieved. In other words, are the students successful on the job and in subsequent coursework? Key questions which might be addressed in the product evaluation process are as follows:

1. Are students successful on the job after completing the program?
2. Do students possess the appropriate skills, knowledge, and attitudes required for success?
3. Are there other skills, knowledge, and attitudes required on the job or in other courses, included in the program?
4. Are the performance criterion/standards appropriate?
5. Have the competencies and content of the vocational program become obsolete?

There are a number of methods for obtaining the necessary information in measuring outcomes of learning in terms of student achievement and program effectiveness. Among these, but not limited to them, are the following methods of product evaluation:

1. Student follow-up surveys
2. Employer surveys
3. Student interviews
4. Review of placement data
5. Consultant team evaluations

It is suggested that a product evaluation procedure involve several of the above methods or sources in the measurement process. A sample program evaluation form is provided on pages 160-161.

In conclusion, evaluation of instructional effectiveness is a necessary component of CBE implementation. Without some form of evaluation, it is difficult for the teacher to determine whether the instructional process is

effective and the program's goals are achieved. To be effective, the evaluation process must be an integral part of the program and conducted on a regular basis. Through effective evaluation the goal and purpose of the program can be better realized and, therefore, ensure that the individual needs of the student are met.

SUMMARY

The use of competency profiles/records in CBE is an important characteristic which is required by State CBE Standards. There are many successful documentation systems currently being used in vocational programs in Virginia. Vocational teachers should review carefully present systems before implementation in order to ensure compatability with local needs and requirements.

The competency recording system is a valuable tool for vocational education, serving many groups: students, teachers, counselors, parents, employers, and placement personnel. The selection and development of the documentation system must be considered carefully if the purposes and uses of the system are to be realized.

The final step in the implementation process is evaluation of the program to determine its effectiveness in terms of operation (process) and outcomes (product). A continuous and systematic evaluation program is necessary for competency-based programs. Through evaluation the role-relevant nature of the vocational program can be maintained.

CBE STANDARD IV CHECKLIST

The purpose of this checklist is to assist the teacher or administrator in determining whether a vocational program complies with the requirements and criteria of CBE Standard IV: "A system exists for documenting the competencies achieved by each student."

	YES	NO	?
A. There is a documentation system (competency record/profile) for student achievement in each vocational program, course, or unit.			
B. The competency record/profile includes the following:			
a. Student name			
b. Program title			
c. Listing of all terminal competencies			
d. Rating scale			
e. Method for authenticating the record/profile			
C. The competency record/profile documents achievement for each student.			
D. The competency record/profile is available for the following purposes:			
a. Articulation			
b. Student achievement records			
c. Employer information			

EVALUATION: A vocational program complies with Virginia CBE Standard IV when all items are checked YES.

SAMPLE MATERIALS

ATTITUDES & WORK HABITS

	GRADING PERIODS					
	1	2	3	4	5	6
SAFETY CONSCIOUSNESS						
WILLINGNESS TO FOLLOW INSTRUCTIONS						
COOPERATION WITH FELLOW STUDENTS						
CONSTRUCTIVE USE OF TIME						
INTEREST IN DOING QUALITY WORK						
CARE OF TOOLS AND EQUIPMENT						
DEPENDABILITY						
INITIATIVE						
PUNCTUALITY						
CLUB PARTICIPATION						

RATING SCALE

E - EXCELLENT
 G - GOOD
 S - SATISFACTORY
 N - NEEDS IMPROVEMENT
 U - UNSATISFACTORY

ATTENDANCE

	GRADING PERIODS						TOTALS
	1	2	3	4	5	6	
DAYS ABSENT							
DAYS PRESENT							
TOTALS							
DAYS TARDY							

GRADES

	GRADING PERIODS								SEM	FINAL
	1	2	3	SEM	4	5	6	SEM		
NUMERICAL GRADE										
LETTER GRADE										

FLOYD S. KAY
 VOCATIONAL-TECHNICAL CENTER
 ROCKBROOK COUNTY SCHOOLS

STUDENT'S VOCATIONAL COMPETENCY REPORT

STUDENT'S NAME _____
 SOCIAL SECURITY NO. _____ SESSION _____
 PROGRAM _____
 HOME SCHOOL _____

VOCATIONAL COMPETENCY REPORTING SYSTEM

The STUDENT'S VOCATIONAL COMPETENCY REPORT is a comprehensive record of the training received by the student in his or her vocational program. The Report consists of the following parts:

1. Competency Profile: a coded record of the vocational competencies in which the student received training for each grading period, the number of hours of training received by the student for each competency, and the instructor's rating of the student's performance level for each competency.
2. Competencies List: a comprehensive listing of the competencies included in the student's vocational program. Code numbers given in the Competency Profile refer to competencies in the Competencies List.
3. Attitudes and Work Habits: the instructor's rating per grading period of student attitudes and work habits considered important for successful employment.
4. Attendance: days absent, days present, and times tardy for each grading period and for the school year.
5. Grades: numerical and/or letter grades for each grading period, each semester, and for the school year.

PARENT / GUARDIAN SIGNATURE _____ (1)
 _____ (2)
 _____ (3)
 _____ (4)
 _____ (5)

[illegible]

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for
Fullerton, Texas, U.S.A.

- D. 1 Complete a connection on shop operation.
- D. 2 Complete general shop safety training.
- D. 3 Take measurements accurately.
- D. 4 Complete basic math requirements.
- D. 5 Operate tool and material checkout.
- D. 6 Read and interpret blueprints.
- D. 7 Set up and level a transit.
- D. 8 Mount grades.
- D. 9 Layout a building site with a transit.
- D. 10 Layout a building site with a tape measure.
- D. 11 Construct and set up a batter board.
- E. 1 Complete masonry safety task.
- E. 2 Identify masonry tools.
- E. 3 Demonstrate use and care of basic masonry tools.
- E. 4 Mix mortar and stack materials.
- E. 5 Lay a course of bricks.
- E. 6 Build a rock back load.
- E. 7 Build a 9 course brick wall.
- E. 8 Build a brick corner.
- E. 9 Complete carpentry safety task.
- E. 10 Identify basic carpentry tools.
- E. 11 Demonstrate use and care of hand tools.
- E. 12 Identify lumber sizes, grades and defects.
- E. 13 Identify nails and fasteners.
- E. 14 Identify other common materials.
- E. 15 Assemble floor framing and subfloor.
- E. 16 Assemble wall framing.
- E. 17 Assemble roof framing (trusses and rafters).
- E. 18 Apply roofing materials.
- E. 19 Apply siding.
- E. 20 Caulk and paint exterior surfaces.
- F. 1 Complete electrical safety exam.
- F. 2 Demonstrate knowledge of basic electrical fundamentals and symbols.
- F. 3 Identify basic electrical tools.
- F. 4 Identify basic wires, buses, outlets and switches.
- F. 5 Make basic splices and connections.
- F. 6 Pull wires through studs and conduit.
- F. 7 Install a single pole switch.
- F. 8 Install a lighting fixture.
- F. 9 Install receptacles.
- F. 10 Install 3-way switches.
- F. 11 Make connections to entrance panel.
- F. 12 Read basic electrical blueprints.
- G. 1 Complete plumbing safety task.
- G. 2 Identify basic plumbing tools.
- G. 3 Identify common plumbing fittings and materials.
- G. 4 Demonstrate use of common tools.
- G. 5 Cut copper tubing to length.
- G. 6 Cut plastic pipe to length.
- G. 7 Cut steel pipe to length.
- G. 8 Join copper pipe.

AUTOMOTIVE MECHANICS
COMPETENCY RECORD

STUDENT NAME _____ SSN/STUDENT NO. _____ SCHOOL/S _____

AUTO MECHANICS	I	II	III
COURSE NUMBERS:	<u>8506</u>	<u>8507</u>	<u>8508</u>

CLASSROOM HOURS: I ___ II ___ III ___

RATING SYSTEM

A or 4 - HIGHLY PROFICIENT

B or J - COMPETENT

C or 2 - PARTIALLY PROFICIENT

D or I - LIMITED

E or 0 - CANNOT PERFORM

STUDENT PERSONAL PERFORMANCE

This record reflects the Instructor's opinion.

A. USES TIME WELL

B. DEPENDABILITY

C. FOLLOWS INSTRUCTIONS

D. WORKS WELL WITH OTHERS

E. TAKES CARE OF TOOLS AND EQUIP.

P. TAKES PRIDE IN WORKMANSHIP

G. ATTENDS REGULARLY

W. IS AMBITIOUS

I. COMMUNICATES WELL WITH OTHERS

J. ACCEPTS CRITICISM WELL

K. SAFETY HABITS

DIRECTIONS: The Instructor will signify competency/task achievement by entering a date, rating and initials (in ink) in the spaces provided. If the competency cannot be achieved due to circumstances beyond the control of the students, the instructor will enter "N/A" in place of an achievement date.

*RATING SYSTEM DETAILED EXPLANATION
ON REVERSE SIDE.

SCHOOL YEAR

COMPETENCIES

PERFORMING STATE INSPECTION

- 1.1 Inspect turn signals
- 1.2 Inspect steering linkage and steering gear
- 1.3 Inspect braking system
- 1.4 Inspect exhaust system
- 1.5 Perform operational inspection of lighting system
- 1.6 Inspect tires
- 1.7 Locate vehicle ID number and determine year of manufacture
- 1.8 Inspect emission control devices
- 1.9 Inspect glass and windshield wipers
- 1.10 Inspect front suspension

I	A M
	DATE
	RATING
	INITIALS

II	A N
	DATE
	RATING
	INITIALS

III	A A M
	DATE
	RATING
	INITIALS

RATING SYSTEM

- A or 4 - HIGHLY PROFICIENT: Can complete task quickly and accurately. Can direct others in how to do task. Needs only normal supervision.
- B or 3 - COMPETENT: Can do all parts of the task. Needs only spot check of completed work. Meets minimum entry level requirements. Needs job entry supervision.
- C or 2 - PARTIALLY PROFICIENT: Can do most parts of the task. Needs help only on hardest parts. May not meet all job entry level requirements for speed and accuracy. Needs close supervision.
- D or 1 - LIMITED: Can do simple parts of task. Needs to be told or shown how to do most of task. Needs extremely close supervision.
- E or 0 - Can not perform any part of task at a level sufficient for participation in a work environment.

SOUTHWEST VIRGINIA
ARTICULATION PROJECT

/INDIVIDUAL COMPETENCY RECORD/

STUDENT'S NAME _____ SOCIAL SECURITY # _____
SCHOOL(S) _____
SECONDARY PROGRAM _____ POST-SEC. PROGRAM _____
OCCUPATIONAL TITLE _____ DOT NUMBER _____

[illegible]

Rating Scale

- 4 -- Can perform this task without supervision or assistance (A) with proficiency in speed and quality OR (B) with initiative and adaptability to special problem situations OR (C) and can lead others to performing it.
- 3 -- Can perform this task satisfactorily without assistance and/or supervision.
- 2 -- Can perform this task satisfactorily, but requires periodic supervision and/or assistance.
- 1 -- Can perform some parts of the task satisfactorily, but requires instruction and supervision to perform entire task.
- 0 -- Has some knowledge and limited experience, but not sufficient to perform the task.

P -- Task verified by test, articulation record, or previous work experience.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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PROGRAM COMPETENCIES	SECONDARY PROGRAM			POST-SECONDARY PROGRAM		
	Rating	Date	Initials	Rating	Date	Initials
Operate calculating equipment by touch						
Compute and verify amounts and totals						
Answer and route phone calls						
Place local and long distance calls						
Compose and type business correspondence						
Perform receptionist activities						
Prepare requisitions						
Prepare purchase orders						
Process and extract information from unpaid invoices						
Process check records						

Page _____ of _____

PENINSULA ARTICULATION PROJECT

COMPETENCY RECORD

NAME OF STUDENT: _____ SOCIAL SECURITY NO. _____

COURSE/OCCUPATION: _____

THIS RECORD SHOWS THE COMPETENCIES DEMONSTRATED BY THE PERSON ABOVE ON THE DATE SPECIFIED IN THE DESIGNATED INSTRUCTIONAL AREA. THIS DOCUMENT WILL BECOME A PART OF THE STUDENT'S CUMULATIVE RECORD AND WILL BE AVAILABLE TO SUBSEQUENT TRAINING INSTITUTIONS OR PROSPECTIVE EMPLOYERS. THE STUDENT WILL BE PROVIDED A COPY OF THIS COMPETENCY RECORD UPON TERMINATION OF HIS TRAINING.

RATING SCALE

- | | |
|-------|--|
| 1. | Performs task/competency above job entry level |
| 2. | Performs task/competency at job entry level |
| 3. | Task/competency accomplished by challenge test |
| Blank | Has not demonstrated mastery of this task/competency |

SCHOOL(S) ATTENDED/EMPLOYER	PHONE #	DATES ATTENDED (FROM) (TO)	INSTRUCTOR'S NAME(S)	STATUS OF PROGRAM COMPLETION	HOURS
-----------------------------	---------	-------------------------------	----------------------	---------------------------------	-------

_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

I CERTIFY THAT THIS RECORD OF MY COMPETENCIES IS A CORRECT AND ACCURATE DOCUMENT.

_____	_____	_____	_____
(Signature)	(Signature)	(Signature)	

COMPETENCY RECORD	SECONDARY			POST SECONDARY		
	DATE	RATING	INSTRUCTOR	DATE	RATING	INSTRUCTOR
Directions: Date, Initial and rate competency/task achievement in the appropriate columns. Intermediate competency/task achievements should be recorded in pencil with final achievements dated and initialed in ink.						

COMPETENCY RECORD	SECONDARY			POST SECONDARY		
	DATE	RATING	INSTRUCTOR	DATE	RATING	INSTRUCTOR
Directions: Date, Initial and rate competency/task achievement in the appropriate columns. Intermediate competency/task achievements should be recorded in pencil with final achievements dated and initialed in ink.						



INDUSTRIAL ARTS EDUCATION SERVICE
COMMONWEALTH OF VIRGINIA

RATING SCALE

Name: _____

SS Student No.: _____

School: _____

School System: _____

GRAPHIC COMMUNICATIONS I: 8466

4. PERFORMANCE ABOVE CRITERION
3. PERFORMANCE AT CRITERION
2. PERFORMANCE BELOW CRITERION
1. HAS BASIC KNOWLEDGE
N/A NOT ACHIEVED

Directions: The instructor will signify competency/task achievement by entering the rating and date in the space provided. If the competency cannot be achieved due to circumstances beyond the control of the student the instructor will enter an "N/A" in place of an achievement date.

CONTENT/CONCEPTS	TASK	RATING	ACHIEVEMENT DATE
Introduction _____	1A. Purpose and Influence _____	_____	_____
	1B. Use of Graphic Communications _____	_____	_____
	2. Safety _____	_____	_____
	3. Image Transfer Processes _____	_____	_____
Design _____	4. Design Principles _____	_____	_____
Job Planning _____	5. Sketches & Layouts _____	_____	_____
	6. Dummy Make-up _____	_____	_____
Image Generation _____	7. Image Generation _____	_____	_____
	8. Mechanical Layout _____	_____	_____
	9. Clip Art & Preprint Type _____	_____	_____
	10. Typewriter _____	_____	_____
	11. Photocomposition _____	_____	_____

GRAPHIC COMM: 8466

Name: _____

SS/Student No.: _____

<u>CONTENT/CONCEPTS</u>	<u>TASK</u>	<u>RATING</u>	<u>ACHIEVEMENT DATE</u>
Image Generation cont'd _____	12. Use of Camera _____	_____	_____
	13. Roll Film Development _____	_____	_____
	14. Photographic Prints _____	_____	_____
	25. Reduction & Enlargement _____	_____	_____
	28. Composition Processes _____	_____	_____
Reproduction & Production _____	15. Screen Process Printing _____	_____	_____
	16. Stencil Preparation _____	_____	_____
	17. Use of Block Out _____	_____	_____
	18. Materials for Screen Process _____	_____	_____
	19. Paper Types _____	_____	_____
	21. Safety with Combustibles _____	_____	_____
	✓ 22. Photography in Screen Process _____	_____	_____
	23. Two-Color Prints _____	_____	_____
	24. Process Camera _____	_____	_____
	26. Copy Camera Setup _____	_____	_____
	27. Line Negative/Positive _____	_____	_____
	29. Stripping & Making Flats _____	_____	_____

VOCATIONAL EDUCATION STUDENT COMPETENCY SCAN SHEET

STUDENT NAME SMITH EDWARD G STUDENT NUMBER 30226310133 COURSE METALS/MACHINE
SCHOOL HAMPTON GRADE 11 YEAR 80/81 TCHR NAME BAKER
DIVISION 01001120000300

STUDENT NUMBER									
3	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0

SCHOOL NUMBER									
3	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

DIVISION CODE									
1	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0

COURSE CODE									
8	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

TEACHER NUMBER									
3	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

EVALUATION CODE
4 - ABOVE CRITERION
3 - AT CRITERION
2 - NEEDS SUPERVISION
1 - CANNOT PERFORM TASK
0 - TASK NOT ATTEMPTED
P - ACCOMPLISHED/PRE-TEST
E - EQUIPMENT/NOT AVAILABLE

4.1	0	0	0	0	0	0	0	0	0	5.12	0	0	0	0	0	0	0	0	0	9.10	0	0	0	0	0	0	0	0	0	10.30	0	0	0	0	0	0	0	0	0
4.2	0	0	0	0	0	0	0	0	0	6.1	0	0	0	0	0	0	0	0	0	9.11	0	0	0	0	0	0	0	0	0	11.1	0	0	0	0	0	0	0	0	0
4.3	0	0	0	0	0	0	0	0	0	6.2	0	0	0	0	0	0	0	0	0	9.12	0	0	0	0	0	0	0	0	0	11.2	0	0	0	0	0	0	0	0	0
4.4	0	0	0	0	0	0	0	0	0	6.3	0	0	0	0	0	0	0	0	0	9.13	0	0	0	0	0	0	0	0	0	11.3	0	0	0	0	0	0	0	0	0
4.5	0	0	0	0	0	0	0	0	0	6.4	0	0	0	0	0	0	0	0	0	9.14	0	0	0	0	0	0	0	0	0	11.4	0	0	0	0	0	0	0	0	0
4.6	0	0	0	0	0	0	0	0	0	6.5	0	0	0	0	0	0	0	0	0	9.15	0	0	0	0	0	0	0	0	0	11.5	0	0	0	0	0	0	0	0	0
4.7	0	0	0	0	0	0	0	0	0	7.1	0	0	0	0	0	0	0	0	0	9.16	0	0	0	0	0	0	0	0	0	11.6	0	0	0	0	0	0	0	0	0
4.8	0	0	0	0	0	0	0	0	0	7.2	0	0	0	0	0	0	0	0	0	9.17	0	0	0	0	0	0	0	0	0	11.7	0	0	0	0	0	0	0	0	0
4.9	0	0	0	0	0	0	0	0	0	7.3	0	0	0	0	0	0	0	0	0	9.18	0	0	0	0	0	0	0	0	0	11.8	0	0	0	0	0	0	0	0	0
4.10	0	0	0	0	0	0	0	0	0	7.4	0	0	0	0	0	0	0	0	0	9.19	0	0	0	0	0	0	0	0	0	11.9	0	0	0	0	0	0	0	0	0
4.11	0	0	0	0	0	0	0	0	0	7.5	0	0	0	0	0	0	0	0	0	9.20	0	0	0	0	0	0	0	0	0	11.10	0	0	0	0	0	0	0	0	0
4.12	0	0	0	0	0	0	0	0	0	7.6	0	0	0	0	0	0	0	0	0	10.1	0	0	0	0	0	0	0	0	0	11.11	0	0	0	0	0	0	0	0	0
4.13	0	0	0	0	0	0	0	0	0	7.7	0	0	0	0	0	0	0	0	0	10.2	0	0	0	0	0	0	0	0	0	11.12	0	0	0	0	0	0	0	0	0
4.14	0	0	0	0	0	0	0	0	0	8.1	0	0	0	0	0	0	0	0	0	10.3	0	0	0	0	0	0	0	0	0	11.13	0	0	0	0	0	0	0	0	0
4.15	0	0	0	0	0	0	0	0	0	8.2	0	0	0	0	0	0	0	0	0	10.4	0	0	0	0	0	0	0	0	0	11.14	0	0	0	0	0	0	0	0	0
4.16	0	0	0	0	0	0	0	0	0	8.3	0	0	0	0	0	0	0	0	0	10.5	0	0	0	0	0	0	0	0	0	11.15	0	0	0	0	0	0	0	0	0
4.17	0	0	0	0	0	0	0	0	0	8.4	0	0	0	0	0	0	0	0	0	10.6	0	0	0	0	0	0	0	0	0	11.16	0	0	0	0	0	0	0	0	0
4.18	0	0	0	0	0	0	0	0	0	8.5	0	0	0	0	0	0	0	0	0	10.7	0	0	0	0	0	0	0	0	0	11.17	0	0	0	0	0	0	0	0	0
4.19	0	0	0	0	0	0	0	0	0	8.6	0	0	0	0	0	0	0	0	0	10.8	0	0	0	0	0	0	0	0	0	11.18	0	0	0	0	0	0	0	0	0
4.20	0	0	0	0	0	0	0	0	0	8.7	0	0	0	0	0	0	0	0	0	10.9	0	0	0	0	0	0	0	0	0	11.19	0	0	0	0	0	0	0	0	0
4.21	0	0	0	0	0	0	0	0	0	8.8	0	0	0	0	0	0	0	0	0	10.10	0	0	0	0	0	0	0	0	0	11.20	0	0	0	0	0	0	0	0	0
4.22	0	0	0	0	0	0	0	0	0	8.9	0	0	0	0	0	0	0	0	0	10.11	0	0	0	0	0	0	0	0	0	11.21	0	0	0	0	0	0	0	0	0
4.23	0	0	0	0	0	0	0	0	0	8.10	0	0	0	0	0	0	0	0	0	10.12	0	0	0	0	0	0	0	0	0	11.22	0	0	0	0	0	0	0	0	0
4.24	0	0	0	0	0	0	0	0	0	8.11	0	0	0	0	0	0	0	0	0	10.13	0	0	0	0	0	0	0	0	0	11.23	0	0	0	0	0	0	0	0	0
4.25	0	0	0	0	0	0	0	0	0	8.12	0	0	0	0	0	0	0	0	0	10.14	0	0	0	0	0	0	0	0	0	11.24	0	0	0	0	0	0	0	0	0
4.26	0	0	0	0	0	0	0	0	0	8.13	0	0	0	0	0	0	0	0	0	10.15	0	0	0	0	0	0	0	0	0	11.25	0	0	0	0	0	0	0	0	0
4.27	0	0	0	0	0	0	0	0	0	8.14	0	0	0	0	0	0	0	0	0	10.16	0	0	0	0	0	0	0	0	0	12.1	0	0	0	0	0	0	0	0	0
4.28	0	0	0	0	0	0	0	0	0	8.15	0	0	0	0	0	0	0	0	0	10.17	0	0	0	0	0	0	0	0	0	12.2	0	0	0	0	0	0	0	0	0
4.29	0	0	0	0	0	0	0	0	0	8.16	0	0	0	0	0	0	0	0	0	10.18	0	0	0	0	0	0	0	0	0	12.3	0	0	0	0	0	0	0	0	0
5.1	0	0	0	0	0	0	0	0	0	8.17	0	0	0	0	0	0	0	0	0	10.19	0	0	0	0	0	0	0	0	0	12.4	0	0	0	0	0	0	0	0	0
5.2	0	0	0	0	0	0	0	0	0	8.18	0	0	0	0	0	0	0	0	0	10.20	0	0	0	0	0	0	0	0	0	12.5	0	0	0	0	0	0	0	0	0
5.3	0	0	0	0	0	0	0	0	0	9.1	0	0	0	0	0	0	0	0	0	10.21	0	0	0	0	0	0	0	0	0	12.6	0	0	0	0	0	0	0	0	0
5.4	0	0	0	0	0	0	0	0	0	9.2	0	0	0	0	0	0	0	0	0	10.22	0	0	0	0	0	0	0	0	0	12.7	0	0	0	0	0	0	0	0	0
5.5	0	0	0	0	0	0	0	0	0	9.3	0	0	0	0	0	0	0	0	0	10.23	0	0	0	0	0	0	0	0	0	12.8	0	0	0	0	0	0	0	0	0
5.6	0	0	0	0	0	0	0	0	0	9.4	0	0	0	0	0	0	0	0	0	10.24	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
5.7	0	0	0	0	0	0	0	0	0	9.5	0	0	0	0	0	0	0	0	0	10.25	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
5.8	0	0	0	0	0	0	0	0	0	9.6	0	0	0	0	0	0	0	0	0	10.26	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
5.9	0	0	0	0	0	0	0	0	0	9.7	0	0	0	0	0	0	0	0	0	10.27	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
5.10	0	0	0	0	0	0	0	0	0	9.8	0	0	0	0	0	0	0	0	0	10.28	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
5.11	0	0	0	0	0																																		

SCHOOL :
COURSE : 884800 METAL/MACHINE SHOP
DATE : JUN 24/81

SCHOOL SKILLS PROFILE
VOCATIONAL EDUCATION PROGRAM
JPAP

PAGE 1 OF 5

EVALUATION CODES:

9 = ABOVE CRITERION
3 = AT CRITERION

8 = NEEDS SUPERVISION
1 = CANNOT PERFORM TASK

0 = TASK NOT ATTEMPTED
P = ACCOMPLISHED/PRE-TEST

E = EQUIPMENT/NOT AVAILABLE

SKILL NUMBER	SKILL TEXT	RATINGS IN PERCENT						
		9	8	7	6	5	P	E
1-0	MAINTAINING MACHINES AND TOOLS							
1-1	INSPECT WORK AREA FOR SAFE WORKING EQ				88			13
1-2	INSPECT & CHANGE DRIVE PULLEYS/BELTS			67			13	
1-3	INSPECT/REMOVE/ADJ. MACHINE PARTS			63				
1-4	REMOVE MACHINE PARTS							
1-5	REPLACE & ADJUST MACHINE PARTS	43		13				13
1-6	INSPECT & REPAIR HAND TOOLS				13	80		
1-7	PERFORM MAINTENANCE ON LATHE	13		28			80	
1-8	PERFORM MAINTENANCE ON MILLING MACH-			13	13		38	13
1-9	PERFORM MAINTENANCE ON DRILL PRESS			25			38	13
1-10	PERFORM MAINTENANCE ON GRINDER							
1-11	PERFORM MAINTENANCE ON POWER SAWS	38	13		13	13		
1-12	SELECT COOLANTS/OIL/COMPOUNDS- MACH. OPS-	13	80		13			
1-13	INSPECT ARBOR PRESS FOR SAFE OPERATING COND.			28	50		13	
1-14	CLEAN ARBOR PRESS	13	13	28	38			
1-15	LUBRICATE ARBOR PRESS			13	50	13		
1-16	INSPECT HYDRAULIC PRESS FOR SAFE OPER. COND.			38	50			
1-17	CLEAN HYDRAULIC PRESS	25	25	38				
1-18	LUBRICATE HYDRAULIC PRESS			38	13	13	28	
1-19	CLEAN AND LUBRICATE A VISE	13	38	13		13	28	
1-20	INSTALL/INSPECT/LEVEL/A FASTEN DOWN MACHINES			38	13		13	25
1-21	CLEAN/STORE HAND TOOLS-CUTTERS/FIXTURES/JIGS & ATTACHMENTS	13	13	13		13	28	13
1-22	STORE GRINDING WHEEL	28		13		28	28	
1-23	STORE PRECISION TOOLS	80	13	13			13	
1-24	RECYCLE SCRAP METAL CHIPS/SHAVINGS/TRASH OR WASTE MATERIALS	13	38	13		13		13
1-25	CLEAN AND MAINTAIN WORK AND ADJACENT AREAS	13	13	38	13			13
1-26	SCRAPE AND PAINT MACHINES			13	38		13	
1-27	PAINT FACILITIES			13	38	13	28	
1-28	SWEEP AND CLEAN SHOP FACILITIES			28	13	28	13	13
1-29	PERFORM CUSTODIAL TASKS	28		28	13	13		17
		13		28		28	13	13
2-0	PERFORMING BENCH WORK							
2-1	CUT MATERIALS WITH HAND HACKSAW	13		13	13	13	38	
2-2	CUT THREADS WITH HAND TAPS	38		13	13			28
2-3	CUT THREADS WITH DIES			28	25	13	28	
2-4	DISASSEMBLE AND ASSEMBLE PARTS			13	13	13	38	
2-5	HONE AND LAP SURFACES			28	13	38		13
2-6	HAND SHARPEN CUTTING TOOLS WITH ABRASIVE STONES			38	38		13	
2-7	REAM HOLES WITH HAND REAMERS	13	13	80				
2-8	REMOVE AND REPLACE THREAD INSERTS	13		25	50	13		
2-9	REMOVE DAMAGED SCREWS & OTHER NON-HARDENED THREAD HARDWARE	13	13	38	13			
2-10	WORM AND SHAPE METAL USING HAND TOOLS			63		28		13
2-11	CLAMP WORK IN MOLDING DEVICE	25	28		28			
2-12	PERFORM BENCH FILING			13	60	28		

** CONTINUED **

STUDENT NAME: _____
 COURSE: METAL/MACHINE SHOP
 COURSE NUMBER: 83-800

STUDENT SKILLS PROFILE
 VOCATIONAL EDUCATION PROGRAM
 (VPAP)

DIVISION:
 SCHOOL:
 DATE: JUL 24, 81

PAGE 1 OF 2

EVALUATION CODES:

4 - ABOVE CRITERION 2 - NEEDS SUPERVISION 0 - TASK NOT ATTEMPTED E - EQUIPMENT/NOT AVAILABLE
 3 - AT CRITERION 1 - CANNOT PERFORM TASK P - ACCOMPLISHED/PRE-TEST

SKILL NUMBERS	SKILL TEST	DATE	DATE	SKILL NUMBERS	SKILL TEST	DATE	DATE
		ING	COMPL			ING	COMPL
9-0 MAINTAINING MACHINES AND TOOLS				6-0 HEAT TREATING METALS			
9-1 INSPECT WORK AREA--SAFE EQUIP.		1	06-81	6-1 HEAT TREAT METALS		2	06-81
9-2 INSPECT/CHANGE DR. PULLEYS ON BELTS		2	06-81	6-2 SOFTEN METALS		3	06-81
9-3 INSPE./REMOVE/REPLACE/ADJUST MACH. PARTS		3	06-81	6-3 SURFACE (CASE) HARDEN METALS		4	06-81
9-4 REMOVE MACHINE PARTS		4	06-81	6-4 TEMPER METALS		0	06-81
9-5 REPLACE/ADJUST MACHINE PARTS		0	06-81	6-5 PERFORM HARDENING TECHNIQUES		P	06-81
9-6 INSPECT AND REPAIR HAND TOOLS		P	06-81				
9-7 PERFORM MAINTENANCE ON LATHE		E	06-81	7-0 OPERATING POWER SAWS			
9-8 PERFORM MAINTENANCE ON MILL MACH.		P	06-81	7-1 DETERMINE TYPE MATERIAL TO BE SAWEU		E	06-81
9-9 PERFORM MAINTENANCE ON DRILL PRESS		0	06-81	7-2 SELECT APPROPRIATE BLAUES		P	06-81
9-10 PERFORM MAINTENANCE ON GRINDER		4	06-81	7-3 SELECT/SET SPEEDS AND FEEDS		0	06-81
9-11 PERFORM MAINTENANCE ON POWER SAWS		3	06-81	7-4 SAW W/BAND SAW TO SCRIBED LINES		4	06-81
9-12 SELECT COOLANTS/OILS/COMPOUNDS FOR MACH		2	06-81	7-5 MEASURE/CUT OFF MATERIALS W/PWR M-SAW		3	06-81
9-13 INSPECT ARBOR PRESS--SAFE OP. CONDITION		1	06-81	7-6 REMOVE/REPLACE SAW BLAUES		2	06-81
9-14 CLEAN ARBOR PRESS		2	06-81	7-7 CUT/WEED BAND SAW TO INSERT-CONTOUR		1	06-81
9-15 LUBRICATE ARBOR PRESS		2	06-81				
9-16 INSPECT HYDRAULIC PRESS--SAFE OP. COND.		4	06-81	8-0 OPERATING DRILL PRESS			
9-17 CLEAN HYDRAULIC PRESS		0	06-81	8-1 CONSIDER MATERIAL OF WORK PIECE		2	06-81
9-18 LUBRICATE HYDRAULIC PRESS		P	06-81	8-2 CENTER PUNCH HOLE TO LOCATION		3	06-81
9-19 CLEAN AND LUBRICATE VISE		E	06-81	8-3 DETERMINE HOLDING TECHNIQUES		4	06-81
9-20 INSTALL/INSPEC./LEVEL/FASTEN DOWN MACH		P	06-81	8-4 MOUNT/SECURE WORK IN HOLDING DEVICE		0	06-81
9-21 CLEAN & STONE HAND TOOLS, ETC.		0	06-81	8-5 SELECT TOOL/CUTTER		P	06-81
9-22 STONE GRINDING WHEEL		4	06-81	8-6 SECURE TOOL/CUTTER IN DR. PRESS SPIN		E	06-81
9-23 STONE PRECISION TOOLS		3	06-81	8-7 SELECT SLEEVE TO SUIT DRILL		P	06-81
9-24 RECYCLE SCRAP/ASTE MATERIAL		2	06-81	8-8 SET DRILL FOR PROPER FEEDS & SPEEDS		0	06-81
9-25 CLEAN/MAINTAIN WORK-ADJACENT AREAS		1	06-81	8-9 DRILL HOLE TO SIZE		4	06-81
9-26 SCRAPE & PAINT MACHINES		2	06-81	8-10 SHARPEN DRILL BIT FREE HAND--CHECK		3	06-81
9-27 PAINT FACILITIES		3	06-81	8-11 SHARPEN DRILL--USE GRINDING WHEEL		2	06-81
9-28 SWEEP & CLEAN SHOP FACILITY		4	06-81	8-12 MEAN HOLE TO SIZE		1	06-81
9-29 PERFORM CUSTODIAL TASK		0	06-81	8-13 UPOT-FACE WORKPIECE		2	06-81
8-0 PERFORMING BENCH WORK				8-14 COUNTERSINK HOLE TO REQ.		3	06-81
8-1 CUT MATERIALS WITH HAND HACKSAW		P	06-81	8-15 COUNTERBORE TO DEPTH SPECIFIED		4	06-81
8-2 CUT THREADS WITH HAND TAP		E	06-81	8-16 USE TAPPING ATTACHMENT TO TAP HOLE		0	06-81
8-3 CUT THREADS WITH VISE		P	06-81	8-17 HAND TAP HOLE TO SPECS.		P	06-81
8-4 DISASSEMBLE & ASSEMBLE PARTS		0	06-81	8-18 USE AUTO. FEED ON DRILL PRESS		E	06-81
8-5 HOLE & TAP SURFACES		4	06-81				
8-6 HAND SHARPEN CUTTING TOOLS--ABR. STONE		3	06-81				
8-7 REAM HOLES WITH HAND REAMERS		2	06-81				
8-8 REMOVE & REPLACE IN-HEAD INSERTS		1	06-81				
8-9 REMOVE UNWANTED SCREWS & THREAD HARDWARE		2	06-81				
8-10 WORK & SHAPE METAL USING HAND TOOLS		3	06-81				
8-11 CLAMP WORK IN HOLDING DEVICE		4	06-81				
8-12 PERFORM BENCH FINISH		1	06-81				

*****CONTINUED*****

DIVISION 1
COURSE 1 88480U METAL/MACHINE SHOP
DATE 1 JUN 84 '81

DIVISION SKILLS PROFILE
VOCATIONAL EDUCATION PROGRAM
UPAP

PAGE 1 OF 2

EVALUATION CODES:

1 = ABOVE CRITERION
2 = AT CRITERION

3 = NEEDS SUPERVISION
4 = CANNOT PERFORM TASK

5 = TASK NOT ATTEMPTED
P = ACCOMPLISHED/PRE-TEST

E = EQUIPMENT/NOT AVAILABLE

SKILL NUMBER	SKILL TEST	RATINGS IN PERCENT						
		1	2	3	4	5	P	E
4-0	MAINTAINING MACHINES AND TOOLS							
4-1	INSPECT WORK AREA FOR SAFE WORKING EG	87	11	33				
4-2	INSPECT & CHANGE DRIVE PULLEYS/BELTS	84	18	11				
4-3	INSPECT/REPAIR/ADJ. MACHINE PARTS	60	4	11				
4-4	REMOVE MACHINE PARTS	14	80	4	11			7
4-5	REPLACE & ADJUST MACHINE PARTS	11	43	14	14	11		4
4-6	INSPECT & REPAIR HAND TOOLS	4	25	32	11		11	
4-7	PERFORM MAINTENANCE ON LATHE	44	14	11	7			11
4-8	PERFORM MAINTENANCE ON MILLING MACH.	87	11	7	7			4
4-9	PERFORM MAINTENANCE ON DRILL PRESS	4	17		7	11	4	
4-10	PERFORM MAINTENANCE ON GRINDER	14	87		11	7		
4-11	PERFORM MAINTENANCE ON POWER SAWS	7	61	4	7	4	7	
4-12	SELECT COOLANTS, OIL, COMPOUNDS- MACH. OPS.	4	87	4	14	4	4	
4-13	INSPECT APRON PRESS FOR SAFE OPERATING COND.	4	43	18	88	4		
4-14	CLEAN ANVIL PRESS	7	43	21	18			
4-15	LUBRICATE ANVIL PRESS	4	44	21	14	4		4
4-16	INSPECT HYDRAULIC PRESS FOR SAFE OPER. COND.	4	43	18	11	4	4	4
4-17	CLEAN HYDRAULIC PRESS	4	43	18	11	7		4
4-18	LUBRICATE HYDRAULIC PRESS	4	61	7	7	11	7	
4-19	CLEAN AND LUBRICATE A VISE	87	4	7	7	4	4	
4-20	INSTALL/INSPECT, LEVEL, & FASTEN DOWN MACHINES	11	39	18	7		7	4
4-21	CLEAN/STONE HAND TOOLS, CUTTERS, FIXTURES, JIGS, & ATTACHMENTS	11	43	14	11	7		7
4-22	STONE GRINDING WHEEL	7	39	18	7		4	11
4-23	STONE PRECISION TOOLS	4	43	18	4		4	7
4-24	RECYCLE SCRAP METAL CHIPS, SHAVINGS, TRASH OR WASTE MATERIALS	4	43	25	7	4	4	11
4-25	CLEAN AND MAINTAIN WORK AND ADJACENT AREAS	7	84	7	11		4	4
4-26	SCRAP AND PAINT MACHINES	7	87	7	4	7	4	4
4-27	PAINT FACILITIES	4	61	7	7	7		
4-28	SWEET AND CLEAN SHOP FACILITIES	7	48		11		4	4
4-29	PERFORM CUSTODIAL TASKS	64	4	11	4			4
5-0	PERFORMING BENCH WORK							
5-1	CUT MATERIALS WITH HAND HACKSAW	41	11	11			7	7
5-2	CUT THREADS WITH HAND TAPS	87	7	11	4			7
5-3	CUT THREADS WITH DIES	11	87	7	11		4	
5-4	DISASSEMBLE AND ASSEMBLE PARTS	4	84	7	11	11		
5-5	MOVE AND LAP SURFACES	7	43	21	11		7	
5-6	HAND SHARPEN CUTTING TOOLS WITH ABRASIVE STONES	7	90	18	11			7
5-7	REAM HOLES WITH HAND REAMERS	4	87	7	11		4	
5-8	REMOVE AND REPLACE THREAD INSERTS	87	11	18	7	4		
5-9	REMOVE DAMAGED SCREWS & OTHER NON-HARDENED THREAD HARDWARE	4	44	7	21	4	4	
5-10	WORK AND SHARP METAL USING HAND TOOLS	64	4	11				7
5-11	CLAMP WORK IN HOLDING DEVICE	4	34	7	11	4	4	7
5-12	PERFORM BENCH FILING	61	7	14	7	4	4	

** CONTINUED **

MINI-PACKAGE EVALUATION FORM
ELECTRONICS I (8363)

In order to aid your instructor in the revision of these course materials, please complete this form.

DIRECTIONS: Read each statement carefully and respond to how much you agree or disagree according to the following scale:

SD=Strongly Disagree; D=Disagree; N=Neutral; A=Agree; SA=Strongly Agree

1. The instructions for this Mini-Package were clear and easy to understand. SD D N A SA
2. The material presented helped me learn the stated instructional objective. SD D N A SA
3. The structure and presentation in this Mini-Package were easy to follow. SD D N A SA
4. There was too much material presented in this Mini-Package. SD D N A SA
5. There was too little material presented in this Mini-Package. SD D N A SA
6. The learning sequence or steps helped me learn the stated instructional objectives. SD D N A SA

If there are any comments which you wish to make concerning the content, structure, presentation, or use of the materials in this Mini-Package, please use the space below. Thank you!

EMPLOYER APPRAISAL FORM*

Employer (Firm or Organization) _____

Address _____

Supervisor _____

Name of Employee _____

Job Title _____

Circle the number that describes most adequately the performance of the employee when compared with other office workers of comparable education and experience

1 Knowledge of business operation	Understands the total operation and how the job fits within the system	Makes no effort to learn the total operation and how the job fits within the system	Has no understanding of the total operation and how the job fits within the system
	10 9 8 7	6 5 4 3	2 1 0
2 Knowledge of jobs within the office or unit	Knows and can do most of the jobs within the office or unit	Knows and can do a few of the jobs besides own	Knows only own job
	10 9 8 7	6 5 4 3	2 1 0
3 Knowledge of present job	Good understanding of all details of the job	Average knowledge of all details of the job	Little knowledge of details of the job
	10 9 8 7	6 5 4 3	2 1 0
4 Ability to work with other employees	Is liked by other workers	Has occasional difficulty with other workers	Is disliked by other workers
	10 9 8 7	6 5 4 3	2 1 0
5 Ability to work with supervisors	Is liked by supervisors and executives	Has occasional difficulty with supervisors and executives	Is disliked by supervisors and executives
	10 9 8 7	6 5 4 3	2 1 0
6 Advancement ability	Excellent possibility of advancement	Average possibility of advancement	Little possibility of advancement
	10 9 8 7	6 5 4 3	2 1 0

*Adapted from *Model Vocational Office: A Simulated Training Program*, (Fairfax, Virginia, 22030: Fairfax County Public Schools, 1971), pp. 70-71.

7	Organization of work	Well organized and systematic in work	Organized in some phases of work	Unorganized
		10 9 8 7	6 5 4 3	2 1 0
8	Poise	At ease and handles all situations well	No unusual lack of poise	Ill at ease
		10 9 8 7	6 5 4 3	2 1 0
9	Adaptability	Adjusts well and quickly to change	Has some difficulty adjusting to change	Fights change and has great difficulty making adjustments
		10 9 8 7	6 5 4 3	2 1 0
10	Initiative	Institutes improved procedures	Uses some degree of initiative	Lacks initiative
		10 9 8 7	6 5 4 3	2 1 0
11	Industriousness	Is conscientious and has large volume of work	Does average amount of work	Wastes time and output is unsatisfactory
		10 9 8 7	6 5 4 3	2 1 0
12	Ability to perform	Has good skills in all areas necessary to perform job	Lacks skills in some areas	Is poor in many skills
		10 9 8 7	6 5 4 3	2 1 0
13	Accuracy of work	Seldom makes errors	Makes average number of errors	Makes errors frequently
		10 9 8 7	6 5 4 3	2 1 0
14	Attendance and punctuality	Always there and on time	Occasionally late or absent	Frequently late or absent
		10 9 8 7	6 5 4 3	2 1 0
15	Please comment on areas of improvement that high school training could provide that would have been of benefit to this employee			

SECTION VI

This section contains descriptions and information on instructional resources and materials developed in Virginia. Information is included also on where to obtain additional resources and materials.

Using instructional resources and materials already prepared for vocational programs can save teachers many hours of development. In some instances, existing materials can be revised to meet local program needs. It is, therefore, suggested that a thorough review be made to identify existing resources and instructional materials before developing new materials.

In Virginia there are two major classifications of curriculum materials: instructional resources and instructional materials. Resource materials assist the teacher in developing instructional materials and include task/competency lists, performance/enabling objectives, course outlines, lesson plans, competency recording forms, instructional resource guides, and occupational/career information materials.

If materials are used by students or by the teacher to teach students, then these materials are termed instructional materials. Instructional materials include transparencies, student worksheets, handouts, student information sheets, project sheets, contract forms, and student guides. The distinction between resource materials and instructional materials is made primarily to identify materials and indicate their intended use by the teacher. Materials which are currently under development in Virginia will be designated as either resource or instructional material. At present, there are some materials being used in vocational education which contain both types of instructional materials.

The purpose of this section of the guide is to identify and describe instructional resources and instructional materials available or under development in Virginia. Materials developed by other states are not included, with

the exception of V-TECS Catalogs. Information and questions concerning out-of-state materials should be addressed to the Vocational Education Curriculum Center at Virginia Commonwealth University, 620 N. Lombarday Street, Richmond, Va. 23220 or to persons familiar with instructional materials for vocational education.

INSTRUCTIONAL RESOURCES

Materials which assist the teacher in developing teaching or instructional materials are termed resource materials and therefore described in this section. Instructional resource materials which are under development as well as those available are included.

1. V-TECS Catalogs

The Vocational-Technical Education Consortium of States (V-TECS) of which Virginia is a member, produces validated resource materials for use in curricula development, program planning, and program evaluation. Catalogs are prepared for specific occupational titles and include the following: duty/task list, performance objectives, performance guides (steps for performing the task), equipment/tool lists, bibliography of resource literature, and validation information. Some V-TECS Catalogs include criterion-referenced measures in addition to the other components. The catalogs are useful in implementing competency-based education and identifying role-relevant competencies. A sample V-TECS catalog page is provided on page 183. Catalogs currently available* include:

1252	Advertising Artist	3332	Die Designer Jig and Fixture Designer
1458	Agricultural Equipment Parts Salesperson	2015	Diesel Mechanic
1356	Appliance Repairer	1355	Electronic Mechanic
3231	Architectural Drafter	1344	Emergency Medical Technician
1221	Auto Body Repairer	1111	Environmental Servicer
1223	Auto Mechanic	3221	Executive Secretary
1122	Auto Parts Salesperson	4002	Farm Business Manager
4224	Baker	1251	Farm Equipment Mechanic
2024	Bank Clerk	1790	Farm Equipment Operator
1445	Bank Teller	2156	Farmer, Cash Grain
1121	Bookkeeper	1460	Fashion Salesperson
1126	Bricklayer	4113	Fire Fighter
4115	Building Repairer	1237	Floriculture Worker
2145	Business Machine Repairer	1772	Food Preparation Worker
3112	Cabinetmaker	2023	General House Worker
1444	Carpenter	1222	Greenskeeper
1443	Cashier/Checker	1552	Groundskeeper
3331	Chemical Salesman/Chemical Applicator	3451	Hardware Salesperson
		4221	Heavy Equipment Mechanic
		1456	Home Furnishing Worker
1446	Child Care Attendant	9999	Homemaker: Clothing and Textiles
1124	Clothing Alterationist	9999	Homemaker: Foods
1571	Community Health Aide	9999	Homemaker: Housing and Furnishings
1331	Computer Operator	9999	Homemaker: Human Development
1343	Cosmetologist	9999	Homemaker: Management and Family Economics
1125	Cotton Ginner		
2152	Cotton Grower	1238	Hospital Ward Clerk
1241	Custom Dressmaker	2096	Hotel/Motel Desk Clerk
1441	Dental Assistant	3111	House Electrician
1364	Dental Laboratory Technician	1299	Housing Manager

1453	Industrial Electrician	2021	Retail Credit Manager
4001	Industrial Maintenance Mechanic	1457	Retail Flower Shop Salesperson and Floral Designer
1564	Industrial Sewing Machine Operator	3343	Salesperson - Horticulture and Nursery Production
4111	Janitor	1771	Secretary
3281	Land Survey Party	3441	Security Guard
1454	Legal Secretary	2095	Ship Operations
1123	Licensed Practical Nurse	2133	Small Engine Repairer
1788	Logger	4222	Solar Heating Mechanic
2132	Loom Fixer	1239	Tax Collector
2022	Meat Cutter	2154	Tobacco Grower
1455	Medical Assistant	1442	Tractor Mechanic
1242	Medical Laboratory Technician	4112	Underground Coal Mine Machine Maintenance
4004	Medical Records Technician	2155	Vegetable Grower
4223	Medical Secretary	1791	Veterinary Assistant Occupations
3280	Nuclear Medicine Technologist	3002	Warehouse Worker
1120	Nursery Worker	2013	Water/Wastewater Treatment Plant Operation
1789	Nurse's Aide/Orderly	1236	Welder
2012	Oilfield Technician	3232	Word Processing Administrative Support Secretary
1704	Operating Room Technician Occupations	3222	Word Processing Correspondence Specialist
2153	Orchardist		
2014	Patrolman		
1551	Plumber		
3442	Printing Occupations		
1362	Radio Communications Technician		
1361	Radiographer		
1112	Radio/Television Repairer		
5001	Railroad Track Layer		
1365	Refrigeration Mechanic		
3113	Respiratory Therapist		

The following catalogs are under development by V-TECS members:

3342	Accounting Clerk	3343	Horticulture and Nursery Production Salesperson
4226	Audio-Visual Repairer	3346	Hospital Admitting Clerk
4230	Auto Air Conditioning, Heating and Electrical Specialist	1323	Licensed Practical Nurse (REV)
WV08	Auto Engine and Drive Train Specialist (REV)	1323	Licensed Practical Nurse (IM)
4229	Auto Tune-up Specialist	3347	Machine Tool Operator
3345	Bindery Worker/Web Press Operator	1432	Machinist
3112	Cabinetmaker	SC11	Masonry (IM)
4227	Carpenter (REV)	WV10	Miner I (IM)
2154	Cash Grain/Tobacco Grower	1282	Parenting
1707	Caterers	TW05	Photolab Technician
1132	Cattle Rancher	1706	Poultry Farmer
1272	Commercial Cook	4003	Property Manager
1731	Computer Operator (REV)	4116	Real Estate Agent
TW04	Commercial Photography	3111	Residential Electrician
1366	Concrete Worker	1367	Roofer
1273	Correction Officer	1462	Swine Farmer
4225	Dairy Worker	3471	Secretary (REV)
1705	Data Entry Operator	NV09	Sheep Rancher
4005	Dental Hygienist	1501	Sheet Metal (REV)
3341	Drafter	4228	Sheet Metal Worker (REV)
5002	Duplicating Machine Operator	1581	Tractor Trailer/Truck Drive
SC10	Farm Business Manager	5004	Traffic Manager
3344	Farm Machine Set-up Mechanic	1582	Truck Driver (IM)
1461	Food Marketing Manager Supervisor	4502	Typesetter and Composer
1271	Food Preparation Worker (REV)	1134	Upholsterer
4501	Food Sales Clerk	2152	Vegetable-Grower Orchardist
4114	General Mine Worker	5003	V-TECS Marketing Study
9999	Homemaker: Clothing and Textiles (IM)	4117	Waiter/Waitress

2. Instructional Resource Guides for Competency-Based Education

Currently, the Department of Education, Division of Vocational Education is developing sixty instructional resource guides for the following vocational service areas: Agricultural Education, Business Education, Consumer and Homemaking Education, Occupational Home Economics, Industrial Arts Education, Trade and Industrial Education, and Health Occupations Education. The resource guide serves as a basis for developing a competency-based vocational program, program planning, and program revision. The materials and information in the resource guide will assist the teacher in developing instructional materials. Each resource guide includes occupational/career selection information, duty/task lists, performance objectives, enabling objectives, criterion-referenced measures, selected instructional activities, course outlines, sample CBE management system and sample competency profiles/records. The resource guides, when completed, will be available from the respective service area staff. The following instructional resource guides, by service area, are under development. Those with an asterisk are currently available; the remainder are scheduled for completion during 1983. Sample resource guide pages are included on pages 184-185.

AGRICULTURAL EDUCATION

Agricultural Business
Agricultural Machine Service
Agricultural Mechanics
Agricultural Production (Crops)
Horticulture
Horticulture in an Urban Area
Natural Resources Management
Agricultural Production (Livestock)
Agricultural Processing
Exploratory Agriculture

TRADE AND INDUSTRIAL EDUCATION

Air Conditioning and Refrigeration
Auto Body Repair
Auto Mechanics and Auto Servicing
Building Trades
Carpentry
Commercial Art
Commercial Photography Occupations
Cosmetology
Mechanical Drafting
Electricity (Residential and Industrial)
Electronics
Industrial Cooperative Training
Machine Shop
Masonry
Architectural Drafting
Commercial Foods
Radio and TV Repair
Television Communications
Trade and Industrial Education for Handicapped
(Small Engine Repair)

Welding
 Metal Trades
 General Maintenance Mechanic
 Industrial Maintenance Mechanic
 Sheet Metal Mechanic

BUSINESS EDUCATION

Accounting
 Accounting and Computing Occupations
 Business Data Processing Occupations
 Business Exploration
 Business Law and Business Economics
 General Business
 Office Practice
 Office Services
 Reprographics Occupations
 Shorthand
 Stenography
 Clerk Typist
 Legal Office Procedures
 Medical Office Procedures
 Office Supervision and Management
 Recordkeeping.

INDUSTRIAL ARTS EDUCATION

Construction
 Mechanical Drawing
 Electricity and Electronics Technology
 Graphic Communications
 Industrial Arts Exploring Technology
 Industrial Arts Vocational Occupational
 Exploration (Disadvantaged)
 Vocational Occupational Exploration
 (L.D. Pre-Vocational)
 Woods Technology
 Industrial Occupational Exploration
 Energy/Power and Transportation Technology

HEALTH OCCUPATIONS EDUCATION

Emergency Medical Technician
 Health Aide or Assistant
 Nurse's Aide or Assistant
 Practical Nursing
 Dental Aid
 Medical Assistant

HOME ECONOMICS EDUCATION

Child Care Occupations
 Child Development
 Clothing Management (18 wk.)
 Clothing Services
 Consumer and Homemaking I, II, III
 Family Living
 Food Management (18 wk.)

Food Occupations
 Occupational Home Economics (disadvantaged)
 Home Management (18 wk.)
 Consumer and Homemaking Grade 7
 Home Furnishing Occupations

3. Industrial Arts Education Competency Catalogs

A series of competency catalogs have been developed for Industrial Arts Education to serve as a resource for program content selection, establishing criterion levels for achievement and instructional material development. The catalog format includes area of competence, content/concept, task, criterion-referenced measure, and performance guide. A course description, goals and suggested topical outlines are included in each catalog. The following competency catalogs are available:

Basic Technical Drawing
 Engineering Drawing
 Architectural Drawing
 Electricity and Electronic
 Energy and Power
 Graphic Communications
 Metals Technology
 Woods Technology
 General Industrial Arts
 Industrial Crafts
 Materials and Processes Technology
 Power and Transportation Technology
 Exploring Technology
 Modern Industry
 Construction
 Manufacturing

The competency catalogs may be obtained from the Industrial Arts Education Service Division of Vocational Education, Department of Education, Richmond, VA 23216. A sample catalog page is provided on page 186.

4. Competency-Based Course Outlines for Business and Office Education

A series of competency-based course outlines for business and office education programs which are based on V-TECS, teacher input, previous content guides developed by the service area, and current instructional materials have been developed. Each outline is composed of a course description, listing of skill areas, topical outline, and enabling, terminal, and personal employability competencies. Competency-based outlines are available for the following courses:

Typewriting (6151)
 Clerk-Typist I (6159)
 Clerk-Typist II (6160)
 Stenography I (6250)
 Stenography II (6260)
 Beginning Shorthand (6211)
 Advanced Shorthand (6215)
 Accounting (6320)
 Business Data Processing I (6640)
 Business Data Processing II (6650)

Clerical Accounting I (6340)
 Clerical Accounting II (6350)
 Recordkeeping (6330)
 Survey of Data Processing (6611, 6612)
 Business Careers Simulation (6440)
 Legal Office Procedures (6735)
 Medical Office Procedures (6730)
 Office Reprographics I (6660)
 Office Reprographics II (6670)
 Office Services I (6740)
 Office Services II (6741)
 Office Services III (6742)
 Office Supervision and Management (6430)

A sample page of a competency-based course outline is provided on pages 187-188.

5. Teaching Shorthand and Transcription Instructional Guide

A guide has been developed for teachers of shorthand and transcription. It provides information on the more important aspects of teaching shorthand and transcription. The guide includes sections on the organization and administration of the stenographic program, stages of instruction in shorthand and transcription, and increasing the effectiveness of the stenographic program. A performance goal, teaching suggestions, and evaluation suggestions are given in each section related to the instructional program.

6. Simulation in Business and Office Education

The guide is developed to assist business teachers in effectively using simulations in the classroom. The content includes the following:

1. A description of the general purposes and specific objectives for using simulation in business and office education programs.
2. Procedures for selecting and using simulations.
3. Guidelines for the development and adaptation of simulations.
4. A description of the model office facility with suggestions for the use of simulations.
5. Descriptions of simulation games.

The guide details many considerations applicable to the use of simulations and suggestions helpful to the business teacher.

7. Typewriting

A resource guide has been developed to present suggested content, instructional procedures, and behavioral objectives which are appropriate to instruction in typewriting. Included in the guide are the following:

1. Basic objectives for typewriting courses.
2. Psychological principles of learning and the teaching techniques that apply to typewriting.
3. Information on class organization.
4. Suggested evaluation and grading procedures.
5. Outlines for thirty-four topics including objectives, suggested student-teacher activities, evaluation procedures, and suggested texts and reference materials.

8. Curriculum Guide-General Business

The guide provides a syllabus of the major topics that should be included in the general business course. Each major topic is divided into sub-categories that include specific behavioral objectives, sample evaluation items, and reference materials. The reference material section provides an annotated listing of publications, films, and other aids useful in the general business courses. This guide will eventually be replaced by an instructional resource guide for competency-based education. The new guide will include all materials and resources needed to implement a CBE general business course.

9. Word Processing Handbook for Business Teachers

A handbook has been developed to assist business teachers in implementing word processing into the curriculum. The handbook is designed to be used in business departments with word processing equipment, as well as those which have no equipment. The contents include information on word processing concepts, word processing systems, establishment of processing centers, and types of word processing equipment. The second part of the handbook discusses teaching skills required in the input, output, and distribution phases of word processing. The handbook is useful as a general guide for developing performance objectives, instructional materials, and evaluation materials.

10. Business Data Processing-Program Competencies

A curriculum guide has been designed to assist business teachers in identifying job/opportunity-based data processing program requirements. The first part of the guide provides information on the business data processing program, program goals, employment opportunities, course sequencing,

course descriptions, and the FBLA. The next major part of the guide includes terminal (performance) objectives, enabling objectives, and standard of achievement by occupational title. Information on data processing facilities, equipment, and textbook materials is included in the appendix. The guide is useful in establishing competency-based data processing programs. A sample page from the document is provided on page 189.

11. A Competency-Based Guide for Organizing and Administering Cooperative Office Education

The guide presents a systematic approach to developing competencies that enable teacher-coordinators to effectively establish Cooperative Office Education (COE) programs. The guide consists of ten, competency-based instructional modules which outline procedures for initiating, developing, operating, improving, and evaluating COE programs. The guide serves as a valuable resource for teacher-coordinators in organizing, administering, and improving COE programs. Each module includes a rationale, objectives, learning activities, sample materials, and criterion test. A sample section of the guide is shown on page 190.

12. Marketing and Distributive Education Teacher's Resource Guides

A series of teacher-resource guides are under development for each of the ten marketing and distributive education instruction areas:

1. Self-Development
2. Employment and Advancement
3. Human Relations
4. Communications
5. Market Planning
6. Physical Distribution
7. Sales Promotion
8. Personal Selling
9. Economics and Marketing
10. Marketing Mathematics

Each guide contains the following:

1. A task/competency list
2. Performance objectives for each task/competency

3. A content outline for each task/competency
4. A criterion-referenced measure for each task/competency
5. Instructional activities
6. Audio-visual and text references
7. Masters of handout materials
8. Transparencies
9. Evaluation materials

An introductory booklet to the CBE General Marketing curriculum will be prepared and disseminated with the ten teacher resource guides.

The marketing and distributive education resource guides are intended to serve as a foundation in the development of competency-based education in this area. A sample page from one of the guides under development is provided on page 191.

13. Orientation to DECA Competency-Based Events

A manual which serves as a guide to Distributive Education teacher-coordinators in introducing the competency-based competitive events concept to students. The manual provides students with practice in analyzing job tasks and competencies and assists students in understanding DECA Competitive Events Program. Included in the guide are the following topics:

1. Competency: An introduction
2. Analysis of Job Tasks and Competencies: An Activity
3. Competency-Based Competitive Events: An Explanation
4. Participating in Competency-Based Competitive Events
5. Preparing for Competition

The guide includes an objective, content outline, instructional activities, and transparency masters for each topic.

14. Competency-Based Course Outlines for Home Economics Education

Competency-based course materials in Home Economics Education for both Consumer and Homemaking and Occupational Home Economics based on V-TECS, teacher development, previously developed curriculum guides revised by the service area, and funded curriculum development are available for

implementation in Home Economics Education programs. Consumer and Homemaking and Occupational guides differ somewhat in format; however, each guide is composed of a course description or conceptual structure, performance objectives, performance guides or behavioral guides, enabling objectives, generalizations, competencies, and criterion-referenced measures. The following curriculum materials are available:

1. Competency-Based Curriculum Guide for a Specialized Semester Course in Clothing Management
2. Competency-Based Curriculum Guide for a Specialized Course in Food Management
3. Family Money Management Series: Module I, Values and Decisions in Financial Planning; Module II, The Consumer and Credit; Module III, Consumers in the Marketplace; and, Module IV, Consumers as Citizens
4. Nutrition Education: A Supplement to the Guide for Consumer and Homemaking Education in Virginia Secondary Schools
5. Occupational Child Care Curriculum Guide
6. Occupational Foods Curriculum Guide
7. Vocational Home Economics Curriculum Guide for Occupational Clothing and Textiles
8. Vocational Home Economics Curriculum Guide for Occupational Home and Institutional Services
9. Vocational Home Economics Handbook for Adult Education

GENERAL INFORMATION

The purpose of this section is to provide information to the teacher and administrator about sources from which additional resources and materials can be obtained. These materials can be of value in developing and implementing competency-based vocational programs. Vocational educators should exhaust all available sources before starting the implementation of CBE.

Curriculum Development Centers

There are numerous curriculum development centers and agencies which

offer a variety of curriculum materials: task lists, learning activity packages, transparencies, testing materials, and inservice materials.

following organizations should be contacted to obtain a catalog:

California State Department of Education
721 Capitol Mall
Sacramento, California 95814

Curriculum Materials Service
Department of Vocational Education
Colorado State University
Vocational Education Building
Fort Collins, Colorado 80523

Career Education Center
415 North Monroe Street
Tallahassee, Florida 32306

American Association for Vocational
Instructional Materials
Engineering Center
Athens, Georgia 30602

The Center for Vocational Education
Curriculum Materials Development
628 Aderhold Hall
University of Georgia
Athens, Georgia 30602

Illinois Curriculum Management Center
Division of Vocational and Technical
Education
1035 Outer Park Drive, Suite 201
Springfield, Illinois 62706

Instructional Materials Laboratory
School of Technology
Indiana State University
Terre Haute, Indiana 47800

Minnesota Instructional Materials Center
3300 Century Avenue North
White Bear Lake, Minnesota 55110

Research and Curriculum Coordinating Unit
Mississippi State University
P.O. Drawer DX
State College, Mississippi 39762

Instructional Materials Laboratory
8 Industrial Ed., University of Missouri
Columbia, Missouri 65201

Vocational-Technical Curriculum Laboratory
Rutgers University
Building 4103 - Kilmer Campus
New Brunswick, New Jersey 08903

Iowa Association for Vocational
Instructional Materials
Agricultural Engineering Department
Iowa State University
Ames, Iowa 50010

Kansas Vocational and Technical
Curriculum Center
Kansas State College of Pittsburgh
Pittsburgh, Kansas 66762

Curriculum Development Center
Taylor Education Building, Room 151
University of Kentucky
Lexington, Kentucky 40506

Vocational Curriculum Development
and Research Center
P.O. Box 657
Natchitoches, Louisiana 71457

Vocational Curriculum Research &
Development Center
Department of Industrial Education
University of Maryland
College Park, Maryland 20742

Technical Education Research Center
44 Brattle Street
Cambridge, Massachusetts 02138

Massachusetts Center for Occupational
Education
Two Sun Life Park, 100 Worcester Street
Wellesley Hills, Massachusetts 02181

Curriculum and Instructional Materials
Center
State Department of Vocational and
Technical Education
1515 West Sixth Avenue
Stillwater, Oklahoma 74074

Continuing Education Publications
Extension Annex
Corvallis, Oregon 97331

Vocational Education Resource Center
Regional Office of Education
Box 729
Hato Rey, Puerto Rico 00917

Vocational Instruction Unit
New Mexico State Department of Education
Education Building
Sante Fe, New Mexico 87503

Institute for Occupational Education
Cornell University
Stone Hall
Ithaca, New York 14840

The Center for Occupational Education
North Carolina State University
Raleigh, North Carolina 27607

The Center for Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

Instructional Materials Laboratory
Trade and Industrial Education
The Ohio State University
1885 Neil Avenue
Columbus, Ohio 43210

Vocational Education Media Center
Clemson University
Freemen Hall
Clemson, South Carolina 29631

Vocational Curriculum Laboratory
State of Tennessee
Department of Education
P.O. Box 1114
Murfreesboro, Tennessee 37130

Instructional Materials Center
Division of Extension
The University of Texas at Austin
Austin, Texas 78712

Vocational Instructional Services
Vocational-Industrial Education Department
Texas A & M University
College Station, Texas 77843

Curriculum Laboratory
Cedar Lakes Conference Center
Ripley, West Virginia 25271

Educational Resource Information Center (ERIC)

A network of clearinghouses has been established by the National Institute of Education to collect, select, and catalog educational materials and literature. The network, Educational Resource Information Center (ERIC), provides both hard copies and film copies of cataloged documents. Teachers and administrators should check with their local librarians for additional information concerning ERIC services and materials. The following clearinghouses have been established:

ERIC Clearinghouse in Career Education
The Center for Vocational Education
The Ohio State University
1960 Kenny Road
Columbus, Ohio 43210

ERIC Clearinghouse on Adult Education
and Lifelong Learning
204 Gabel Hall
Northern Illinois University
DeKalb, Illinois 60115

ERIC Clearinghouse for Reading and
Communication Skills
National Council of Teachers of English
1111 Kenyon Road
Urbana, Illinois 61801

ERIC Clearinghouse on Rural Education
and Small Schools
New Mexico State University
Box 3AP
Las Cruces, New Mexico 88003

ERIC Clearinghouse on Early Childhood
Education
College of Education
University of Illinois
805 West Pennsylvania Avenue
Urbana, Illinois 61801

ERIC Clearinghouse on Educational
Management
University of Oregon
Eugene, Oregon 97403

ERIC Clearinghouse on Handicapped and
Gifted Children
Council for Exceptional Children
1920 Association Drive
Reston, Virginia 22091

ERIC Clearinghouse on Higher Education
George Washington University
One Dupont Circle, Suite 630
Washington, D.C. 20036

ERIC Clearinghouse on Information Resources
Stanford University
School of Education
Center for Research and Development
in Teaching
Stanford, California 94305

ERIC Clearinghouse for Junior Colleges
University of California
Powell Library, Room 96
405 Hilgard Avenue
Los Angeles, California 90024

ERIC Clearinghouse on Language
and Linguistics
Center for Applied Linguistics
1611 North Kent Street
Arlington, Virginia 22209

ERIC Clearinghouse on Science, Mathematics
and Environmental Education
The Ohio State University
1800 Cannon Drive
400 Lincoln Tower
Columbus, Ohio 43210

ERIC Clearinghouse for Social Studies/
Social Science Education
855 Broadway Street
Boulder, Colorado 80302

ERIC Clearinghouse on Teacher Education
American Association of Colleges for
Teacher Education
One Dupont Circle, Suite 616
Washington, D.C. 20036

ERIC Clearinghouse on Tests, Measurements,
and Evaluation
Educational Testing Service
Princeton, New Jersey 08540

ERIC Clearinghouse on Urban Education
Columbia University, Teachers College
Box 40
525 West 120th Street
New York, New York 10027

Educational Resources Information Center
Central Office
National Institute of Education
Washington, D.C. 20208

ERIC Processing and Reference Facility
4833 Rugby Avenue, Suite 303
Bethesda, Maryland 20014

ERIC Document Reproduction Service
P.O. Box 190
Arlington, Virginia 22210

The National Network for Curriculum Coordination
in Vocational and Technical Education (NNCCVTE)

The U. S. Department of Education has established a nationwide network of curriculum management centers for providing a means of collecting and sharing curriculum development information and materials. The purpose of this management system is to eliminate the costly duplication of effort in curriculum development.

The network is divided into regions and meet periodically to discuss curriculum activities and the development of products:



1. Northeast Curriculum Coordination Center
Bureau of Occupational Research
Division of Vocational Education
225 West State Street
Trenton, New Jersey 08625
2. Southeast Curriculum Coordination Center
Mississippi State University
Research and Curriculum Unit
Drawer JW
Mississippi State, Mississippi 39762
3. East Central Curriculum Management Center
Illinois Vocational Curriculum Center
Sangamon State University
Springfield, Illinois 62708
4. Midwest Curriculum Coordination Center
Oklahoma State Department of
Vocational & Technical Education
1515 West 6th Avenue
Stillwater, Oklahoma 74074
5. Northwestern Curriculum Coordination Center
Washington State Coordinating Council
for Occupational Education
222 Airdustrial Park/Box 17
Olympia, Washington, 98504
6. Western Curriculum Coordination Center
Vocational Education Section
Department of Education
721 Capitol Mall
Sacramento, California 95814

SAMPLE MATERIALS

Duty: CARING FOR THE NEWBORN INFANT

Task: Feed infant

66. PERFORMANCE OBJECTIVE

Provided an infant and the prescribed formula, feed the infant. The infant and prescribed formula must be positively identified; the infant's head, neck, and back must be supported throughout the feeding; and the infant must be "burped" periodically.

CRITERION-REFERENCED MEASURE

An infant and formula will be provided. Feed the infant.

PERFORMANCE GUIDE

1. Wash hands.
2. Obtain prescribed formula.
3. Identify infant.
4. Check nipple.
5. Test formula temperature.
6. Pick up and hold infant while feeding.
7. Insert nipple into infant's mouth.
8. Hold bottle at approximately 45° angle.
9. Remove bottle from infant's mouth.
10. Lift infant to upright position and support against your upper chest. (NOTE: Support head, neck, and back)
11. "Burp" infant.
12. Continue to alternate feeding and burping until formula is consumed or infant is satisfied.
13. Place infant in bed.
14. Dispose of bottle.
15. Record procedure.

DUTY AREA

2.0 Reproducing drawings

TASK / COMPETENCY

2.1 Prepare prints from original drawings

Application**PROGRAM**

Drafting (171300)

Industrial Arts (109999)

COURSE

Drafting I (8530)

Basic Technical Drawing (8435)

2.1

PERFORMANCE OBJECTIVE

P 2.1 Given an original drawing, reproduction paper, and print machine, make a print of the original drawing which meets the criteria for readability on the rating scale.

ENABLING OBJECTIVES

The drafter will:

- E 2.1.1 Identify and describe the different reproduction processes.
- E 2.1.2 Distinguish between various types of reproduction papers and materials for a specific job.
- E 2.1.3 Discuss safety precautions using ammonia and copy fluids.
- E 2.1.4 Set up and operate a print machine.

CRITERION-REFERENCED MEASURE

C 2.1 Reproduce readable prints from drawing originals.

SELECTED INSTRUCTIONAL ACTIVITIES

1. Provide a lecture on the different reproduction process, materials, and operation of print machines. (E 2.1.1 - E 2.1.4)
2. Demonstrate the selection of appropriate reproduction papers and materials. (E 2.1.2.)
3. Discuss with students the dangers and safety precautions required when using ammonia and special copy fluids. (E 2.1.3)
4. Demonstrate the use of a print machine. (E 2.1.2 & E 2.1.3)
5. Have students prepare prints from various types of originals. (E 2.1.4)

TOOLS AND EQUIPMENT

Scissors

White printer

Xerox machine

Acetate

Sieper paper

SELECTED AUDIO VISUALS

None

SELECTED REFERENCES

French, Thomas E., Engineering Drawing for Students and Draftsmen.

French, Thomas E. and Svensen, Carl L., Mechanical Drawing. Webster Division. McGraw-Hill Book Co., Inc.: St. Louis, IL. 1957.

Giesecke, Frederick E.; Mitchell, Alva; Spencer, Henry Cecil; and Hill, Van Leroy. Technical Drawing. MacMillan Publishing Co., Inc.: New York. 1974.

TASK # 13

AREA OF COMPETENCE: Construction

CONTENT/CONCEPT: Production Technology - Working Drawings

TASK: Name the types of Working Drawings Needed to Explain the Layout and Construction Details of Projects.

CRITERION REFERENCED MEASURE: Develop a working drawing of a construction project to scale.

PERFORMANCE GUIDES:

1. Participate in discussion concerning working drawings.
2. State two reasons why working drawings must be dimensioned as well as drawn to scale.
3. Given the design requirements for a structure, draw the foundation plan to scale and dimension the drawing.
4. Develop a building plan for a house that is to be occupied by an average size family in your community.
5. Develop plans that could be used for a commercial or industrial building in your community.

TYPEWRITING (6151)

Grade Level: 10

Prerequisites: None

Typewriting is a one-year, single-period course offered at the tenth-grade level for any student. There are no previously required courses. Students develop skill in touch typewriting and correct manipulation of the typewriter. Typewriting is a basic communications course and emphasis is given to the application of the typewriting skills to personal and business letters, outlines, manuscripts, and tabulated reports.

Typewriting is a pre-requisite to all occupational preparation offerings in business and office education except Office Services.

The following skill areas are included in Typewriting:

Skill Area 1 - KEYBOARD MASTERY AND RELATED SKILLS

- 1.1 Typewriter Manipulation
- 1.2 Speed and Accuracy
- 1.3 Speed Calculation
- 1.4 Error Identification
- 1.5 Error Correction
- 1.6 Centering
- 1.7 Alignment
- 1.8 Carbon Use
- 1.9 Copy Placement
- 1.10 Typewriting Techniques

Skill Area 2 - LANGUAGE SKILLS

- 2.1 Proofreading
- 2.2 Punctuation
- 2.3 Proofreader's Marks
- 2.4 Numbers
- 2.5 Word Division
- 2.6 Capitalization
- 2.7 Spelling
- 2.8 Composition

Skill Area 3 - TYPEWRITING APPLICATION SKILLS

- 3.1 Letters
- 3.2 Tables and Tabular Reports
- 3.3 Preprinted Forms
- 3.4 Envelopes
- 3.5 Memoranda
- 3.6 Manuscripts
- 3.7 Outlines
- 3.8 Index Cards
- 3.9 Labels

Skill Area 4 - PERSONAL EMPLOYABILITY SKILLS AND KNOWLEDGES

- 4.1 Office Housekeeping Skills
- 4.2 Personal Relationships and Attitudinal Skills
- 4.3 Implementing Instructions
- 4.4 Job-Seeking Skills

TYPEWRITING (6151)			
Topical Outline	Enabling Competencies	Terminal Competencies	Ref.
1. KEYBOARD MASTERY AND RELATED SKILLS	CAN THE STUDENT:	CAN THE STUDENT:	
1.1 <u>Typewriter Manipulation</u>	Manipulate the letter, number, and special keys by touch and use the service parts efficiently?		
1.2 <u>Speed and Accuracy</u>	Demonstrate incremental improve- ment in speed and accuracy?	1.2 Typewrite straight copy at a minimum rate of 35 wpm with a maximum error tolerance of two errors per minute?	
1.3 <u>Speed Calculation</u>	Calculate gross words per minute?		
1.4 <u>Error Identifica- tion</u>	Identify all of the errors in typewritten work?		
1.5 <u>Error Correction</u>	Make acceptable corrections of all typewritten errors?		
1.6 <u>Centering</u>	Center unarranged copy horizontal- ly, vertically, and with spread centering, if appropriate?		
1.7 <u>Alignment</u>	Align paper to make corrections, to typewrite on lines, or to typewrite on pre-printed forms?		
1.8 <u>Carbon Use</u>	Assemble carbon packs; insert, typewrite, and correct errors on original and copies?		

TECHNICAL SKILLS LEARNING OBJECTIVES

The following learning objectives and standards of achievement are designed to provide students with

the necessary entry level technical skills for placement within the indicated data processing occupations:

Punch Card Equipment Operator

A. TERMINAL OBJECTIVE

Ability to develop proficiency in the operations and routine maintenance of the card sorter.

1. ENABLING OBJECTIVE

Be able to operate a card sorter.

STANDARD OF ACHIEVEMENT

- a. Operate the sorter for numeric sorting using a deck of cards with a numeric field. Once sorted, all cards must be in ascending numeric sequence, as verified by listing or by the instructor.
- b. Operate the sorter for alphabetic sorting, using a deck of cards with an alphabetic field. Once sorted, all cards must be in correct alphabetic sequence as verified by listing or by the instructor.
- c. Operate the sorter to select specified cards from a deck, using a deck of punched cards and job instructions. Check the selected cards against the instructor's master list to assure that the correct cards were selected according to the job instructions. No errors are allowed.
- d. Block a deck of punched cards into three groups to be sorted individually. Sort each group of cards. When the blocks are re-assembled, the deck must be in the required sequence. The instructor will check the deck for accuracy of sequencing according to the master checklist.
- e. Operate a sorter having an auxiliary card counter to count a deck of cards. The count must agree with the instructor's count of the card deck.
- f. Sort two decks of cards together as a merging operation. The resulting deck must be in correct order as determined by the instructor's master checklist.

2. ENABLING OBJECTIVE

Be able to perform routine maintenance on the card sorter.

STANDARD OF ACHIEVEMENT

- a. Clear a card jam from the sorter without assistance and without damaging the machine. Accurately reconstruct torn cards. The card jam had been satisfactorily cleared if the machine will continue processing data.
- b. After a new sort brush has been installed on the sorter, adjust the brush to prevent mis-

sorting. Make the adjustment according to the following performance guide. The instructor must approve the adjustment of the brush.

Performance Guide

- (1) Turn on the main-line switch
 - (2) Punch an 8 in a column near the column 80-edge of the card.
 - (3) Place the card in the feed hopper with the card weight.
 - (4) Set the column indicator on the column punched.
 - (5) Turn the hand feed to move the card slowly into the sorter so that contact can be made by the brush through the hole in the card.
 - (6) Listen for a sound like a "CLICK" when contact is made. At this time the card should be approximately 1/32 inch under the end of the first shute blade.
 - (7) Press the start key. The reader sensing device has been properly adjusted when the card falls into the 8 pocket.
 - (8) Repeat the operation near the column 1-edge of the card to check for proper alignment of sensing device for the entire card.
- c. Given a simulated or real breakdown, communicate with the service representative in such a way that the representative can respond to the call. The handling of the service call must be in accordance with the instructor's performance guide.

B. TERMINAL OBJECTIVE

Ability to develop proficiency in the operations and routine maintenance of the reproducer.

1. ENABLING OBJECTIVE

Be able to operate the reproducer.

STANDARD OF ACHIEVEMENT

- a. Operate the reproducer, using a deck of punched cards and a prewired control panel, to produce a second deck that is identical to the source deck. Compare the first and last cards of each deck to assure accuracy (sight-check).
- b. Operate the reproducer, using a detail deck, a master card, and a prewired panel, to gangpunch the current date into the deck. Sight-check the last card gangpunched against the master card. If the reproduced field in the last card is the same as the master

MODULE 6

FINDING TRAINING STATIONS

RATIONALE

Questions such as the following are of particular concern to the new coordinator:

- What constitutes an acceptable training station?
- Where and how do I start looking for cooperating businesses?
- How do I overcome employer resistance?

The purpose of this module is to provide answers to the above questions.

OBJECTIVES

1. Given six descriptions of possible training stations, determine which are acceptable according to a list of criteria.
2. Describe, in sequential order, six activities which a COE coordinator must complete in order to locate potential training stations.
3. Given five negative attitudes toward the COE concept, develop responses to overcome employer resistance to providing training stations because of these attitudes.

DECISION

If you think you can meet the objectives, you may proceed directly to the Criterion Test.

Complete the Learning Activities if you do not believe you can meet the objectives.

LEARNING ACTIVITIES

The following learning activities should enable you to perform as specified in the objectives.

1. Study "Standards for Acceptable Training Stations," page 6.1.
2. Study "Locating Potential Training Stations," page 6.3.
3. Study "Overcoming Resistance," page 6.5.

LEARNING ACTIVITY 1

STANDARDS FOR ACCEPTABLE TRAINING STATIONS

Critical to locating training stations that will provide relevant experiences for each COE student's career objective is the determination of what constitutes an acceptable training station. One does not search for

something without a description of that which is sought. Accordingly, the coordinator should have a set of standards to aid in the identification of acceptable training stations.

In developing standards for acceptable training stations, consideration should be given to five critical areas. A discussion of each of these areas follows.

Willingness of the Business to Cooperate in Training and Teaching

Only those organizations capable and willing to provide occupational training and educational opportunities in keeping with the student's career choices should be selected to participate in the COE program. The company must understand the objectives and goals of the COE program.

You can determine whether this standard is in evidence by the willingness of the organization to develop jointly with the COE coordinator a step-by-step training plan, to assign an experienced worker (called a training sponsor) to supervise the student-learner, and to arrange time to confer periodically with the coordinator. Scheduled conferences between the training sponsor and the coordinator are critical to the success of the program. The coordinator must monitor the implementation of the training plan and evaluate the progress of the student-learner.

Another means of determining whether this standard is being met is to examine the procedures the organization follows in training its full-time personnel. Does it provide systematic training to these employees? Is participation in adult education encouraged? Are personnel involved in developmental skills improvement courses for upward mobility?

Ability of the Organization to Provide Experiences in the Office Occupations Cluster Related to the Student's Career Objectives

The student-learner's job must be one which falls within the office occupations cluster, and it must be related to the student-learner's previously identified career objectives. The training sponsor must express a willingness to provide a variety of learning experiences within the student learner's capabilities.

One stumbling block in choosing an acceptable training station is the new coordinator's desire to find jobs for students as quickly as possible. *Resist the temptation to accept a training station which does not specify the tasks to be performed by the student-learner.* Every effort must be made to select training stations which will provide accounting experiences for accounting students, type-writing experiences for students in that occupational cluster, etc. Since the COE experience

Task IV. Handle Charge Sales Transactions

TOPICAL OUTLINE	PERFORMANCE OBJECTIVES	LEARNING ACTIVITIES RESOURCES and EVALUATION MEASURES
IV. Handling Charge Sales A. Types of credit cards (with examples) 1. Bank credit cards a. VISA b. Master Charge 2. All purpose cards a. Diner's Club b. American Express c. Carte Blanche 3. Industry-sponsored cards a. Exxon b. Shell 4. Retail charge cards a. J.C. Penny Co. b. Thalhimers	IV. Given a written charge policy to follow and necessary props (credit card, charge slip, etc), complete a role play situation in which student works with a "customer" charging a purchase. Charge sales slip must be filled out correctly and proper authorization procedure followed, as evidenced by achieving an acceptable rating on each item on coordinator's check list.	<u>Formative Evaluation (Continued)</u> T - Present each student with an amount of money to pay for a purchase of a specified amount. Vary amounts with each student. Review completed check list with each student, allow additional practice, and repeat role play situation until all items on check list are performed acceptably. <u>Activity IV. A.</u> T - Read "Types of Credit Cards," for background information. Use H.O. #5 to explain the different types of credit cards. Encourage students to give examples of each type of credit card. S - Write examples of types of credit cards in spaces provided on H.O. #5.

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